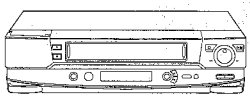
HITACHI

SERVICE MANUAL



TK | No.4809E

VT-FX8000E(AU)
VT-FX8000EM(GKI)NA
VT-FX8000EM(HKN)
VT-FX8000EM(JU)

US MECHANISM

This service manual does not include information on the US Mechanism used in this model. Use this manual together with the following manual.

Manual related to the VT-FX8000E/FX8000EM

Name of manual	Manual No.	Chapters Included
US Mechanism	4527E	------

VHS

This video deck is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

G-CODE

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

August 1998 Image & Information Media Systems Division, Tokai

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

CONTENTS

CHAPTER 1 GENERAL INFORMATION

SPECIFICATIONS 1-1
COMPARISON OF FEATURES 1-2
COMPARISON OF MAIN CONTROL ICs 1-3
TIPS FOR SERVICING 1-4
TROUBLE DISPLAY FUNCTION 1-4
How to Remove the Cassette when a
Malfunction Has Occurred in the Mechanism 1-5
Instructions on Use and Description of New Functions ... 1-6

CHAPTER 2 DISASSEMBLY

1.Before Starting Disassembly 2-1
2.Disassembly Method 2-1
Parts Hierarchy Chart 2-1
Disassembly Procedure Diagrams 2-2
2-1.Top cover, front panel, rear panel, bottom cover and US-FL mechanism 2-2
2-2.Cassette door and buttons 2-2
2-3.Front frame, LCJ and FST boards 2-3
2-4.NCM and N&A, A2 or J&U boards 2-3
2-5.US mechanism/MAS board assembly 2-3
2-6.Separation of MAS board from US mechanism 2-4
2-7.Procedure to remove only the US mechanism 2-4
Cautions When Reinstalling the US Mechanism 2-5

CHAPTER 3 ELECTRIC CICUIT ADJUSTMENT AND TROUBLE DISPLAY

Service Position 3-1
1.Servicing position during electrical adjustment 3-1
2.Servicing positions when repairing and checking circuits 3-1
3.Be careful of electric shocks 3-1
Electrical Circuit Adjustment 3-2
1.Test equipment/jigs necessary for adjustment 3-2
2.Cautions on adjustment 3-2
3.Tips for adjustment 3-2
4.Connections of test equipment 3-2
5.Test Points and Adjustment points 3-3
6.Servo Circuit Adjustments 3-4
6-1.Switching point adjustment 3-4
6-2.X-value adjustment 3-4
6-3.Vertical jitter adjustment 3-5
6-4.Forward slow tracking preset adjustment 3-5
6-5.Reverse slow tracking preset adjustment 3-5
7.Audio Circuit Adjustments 3-6
7-1.Hi-Fi audio playback level check 3-6
7-2.E-E audio level check 3-6
8.Tape Navigation Circuit Adjustment 3-6
8-1.Skew adjustment 3-6
9.MPX Audio Circuit Adjustments 3-6
9-1.MPX separation adjustment 3-6
9-2.MTS input level adjustment 3-6
10.Cylinder Rotation Accumulated Hours of Usage Display 3-7
11.List of Data in EEPROM and Initial Settings 3-7
12.List of Hidden Commands 3-7
12-1.Mode setting commands during adjustment 3-7
12-2.EEPROM initialization commands 3-7
13.Caution When Handling IC4302 (NAVI EEPROM) 3-8
14.Caution When Replacing IC903(EEPROM) 3-8
TROUBLE DISPLAY FUNCTION 3-9
Troubleshooting According to Malfunction Display 3-10

CHAPTER 4 EXPLODED VIEWS

1.CABINET SECTION 4-1
2.US-MECHANISM (TOP VIEW) SECTION 4-2
3.US-MECHANISM (BOTTOM VIEW) SECTION 4-3
4.US-FL MECHANISM SECTION 4-4

CHAPTER 5 REPLACEMENT PARTS LIST

1.MECHANISM PARTS LIST 5-1
2.ELECTRICAL PARTS LIST 5-2

CHAPTER 6	SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS AND MICROPROCESSOR PIN FUNCTION TABLES

CONNECTION DIAGRAM 6-1

	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
LCD/JACK (LCJ)	6-3	6-33
FRONT SHUTTLE (FST)	6-4	6-33
CYLINDER MOTOR	6-5	-
CAPSTAN MOTOR	6-5	-
MAIN1 (MAS)	6-7	6-23
MAIN2 (MAS)	6-10	6-23
NICAM (N&A) [FOR (GKI)NA, (HKN)]	6-13	6-31
A2 (A2) [FOR (AU)]	6-14	6-31
MPX AUDIO (J&U) [FOR (JU)]	6-15	6-32
TAPE NAVIGATION (NCM)	6-17	6-19

WAVEFORMS

SERVO WAVEFORMS 6-6

Y/CHROMA WAVEFORMS 6-6

BLOCK DIAGRAMS

MAIN CONTROL 6-35

SERVO 6-37

VIDEO 6-39

POWER SUPPLY 6-41

AUDIO 6-43

MICROPROCESSOR PIN FUNCTION TABLES 6-45

CHAPTER 1 GENERAL INFORMATION

SPECIFICATIONS

Format:	VHS PAL & NTSC Standard
Recording:	Rotary Two-Head Helical Scan Azimuth Recording
Head:	Double azimuth 4 video heads 2 for SP 2 fo LP/EP 2 Hi-Fi audio heads
Tape Speed:	PAL/MESECAM: 23.39 mm/sec.--SP, 11.7 mm/sec.--LP NTSC: 33.35mm/sec (SP), 16.67mm/sec (LP) (playback only), 11.12mm/sec (EP)
Tape Width:	12.7 mm
Operation Temperature:	5 ℃ TO 40 ℃
Video:	PAL & MESECAM colour & CCIR monochrome signals 625 lines Standard (3.58MHz) and modified (4.43MHz) NTSC colour & EIA standard 525 lines
Recording Time:	480 min. (using E-240 cassette)(PAL/MESECAM LP mode) 480 min. (using T-160 cassette)(NTSC EP mode)
Aerial input:	PAL mode: VHF: 2-12, UHF: 21-69, CATV: X-S41 American NTSC mode: VHF: 2-13, UHF: 14-69, CATV: A-6 - W+84 Japan NTSC mode: VHF: 1-12, UHF: 13-62, CATV: C13-C63
RF Output:	PAL mode: UHF channel 38 (22-53 adjustable)...System I,G and K American NTSC mode: UHF channel 36 or 37 (16-56 adjustable)... System M Japan NTSC mode: UHF channel 35 or 36 (15-55 adjustable)... System M
Video Input:	0.5 to 1.5 Vp-p 75 ohm Unbalanced
Video Output:	1 Vp-p 75 ohm Unbalanced
S/N Ratio (Video):	43 dB
Audio(Linear):	S/N Ration: 43 dB Frequency Range: 70 Hz to 12 kHz
Hi-Fi Audio:	Frequency Range: 20 Hz to 20 kHz Dynamic Range: More than 90 dB Wow and Flutter: Less than 0.005% WRMS
Horizontal Resolution:	Colour 260 lines
Audio Input:	-7.8 dBm 50 Kohm
Audio Output:	-7.8 dBm 1 Kohm
Fast Forward/Rewind Time:	About 2 minutes (with E-180/T-120 cassette)
Power:	AC110-240V, 50/60Hz
Power Consumption:	22 W (including timer) 3.3 W (standby mode)
Timer:	24-hour digital indication
Cabinet Size:	435 mm (W) × 99 mm (H) × 272 mm (D)
Weight:	Approx.. 4.0 kg
Accessories Included:	1--PAL-NTSC aerial cable [For (JU)] 1--Infrared remote control handset 2--Batteries 1--Audio/Video cable 1--Power socket adaptor [For (GKI)NA, (JU)] 1--Aerial plug adaptor [For (JU)]

* Design and specifications are subject to change without notice.

COMPARISON OF FEATURES

	ITEM	VT-FX8000E/FX8000EM	VT-F99EM
GENERAL	VIDEO HEADS	DA4 Heads + Hi-Fi SP : 48 µm LP : 24 µm Hi-Fi : 28 µm	DA4 Heads + Hi-Fi SP : 48 µm LP : 24 µm Hi-Fi : 28 µm
	BASIC CHASSIS TYPE	US	US
	CAPSTAN DRIVE	DIRECT DRIVE	DIRECT DRIVE
	CYLINDER MOTOR	THREE-PHASE OUTER ROTOR : 360Hz	THREE-PHASE OUTER ROTOR : 360Hz
VIDEO	PAL COLOUR	B/G,D/K,I,M (Except for AU) B/G (For AU)	B/G,D/K,I,M
	VIDEO	PAL/MESECAM/PAL60 (PB only) 3.58NTSC/4.43NTSC	PAL/MESECAM/PAL60 (PB only) 3.58NTSC/4.43NTSC
	DYNAMIC PICUTRE ENHANCE	YES	YES
	MESECAM COLOUR	YES	YES
TUNER	TUNING SYSTEM	F.S TUNING	F.S TUNING
	CATV	YES	YES
	CHANNEL PRESET No.	49CH	49CH
	RF CONVERTER	G,I,K,M (Except for AU) G (For AU)	G/K/I,M
	RF CONV. CHANNEL (22-53)	38	38
	A2	YES (Except for JU)	YES (For SWNA)
	NICAM	YES (For GKIDNA,HKN)	YES (For SWNA,HKN)
	MPX AUDIO	YES (For JU)	YES (For JU)
TIMER	REC. PROGRAMME	8 PROG./1 YEAR	8 PROG./1 YEAR
	DIMMER	YES (AUTO)	YES (AUTO)
	IRT	LENGTH ONLY	LENGTH ONLY
	BACK-UP TIME	ABOUT 30 MIN.	ABOUT 30 MIN.
	G-CORD	YES (Except for JU)	YES (For SWNA)
	VISS	YES	YES
OTHER FEATURES	AUTO HEAD CLEANING	YES	YES
	POWER SAVE	YES	YES
	EDIT IN/OUT JACK	NO	NO
	TAPE SPEED	SP/LP (PAL), SP/LP(play only)/EP (NTSC)	SP/LP(PAL), SP/LP (play only)/EP (NTSC)
	VIDEO/AUDIO DUB	NO	NO
	X2 PLAY	NO	NO
	SLOW/REV.SLOW PLAY	YES	YES
	F.ADV PLAY	YES	YES
	SATELLITE CONTROL	YES	YES
	SHUTTLE RING/JOG DIAL	YES	YES
	NTSC PLAYBACK	YES	YES
	FRONT A/V INPUT JACK	YES	YES
	COUNTER GO-TO	NO	NO
	TITLE INDEX	NO	NO
	TROUBLE MODE	YES	YES
	TAPE NAVIGATION	YES	NO
	CLOSED CAPTION	YES	NO
AUTO FEATURES	AUTO TRACKING	YES	YES
	AUTO OPERATE ON	YES	YES
	AUTO PLAY	YES	YES
	AUTO REWIND	YES	YES
	AUTO REW.SHUT OFF	YES	YES
	AUTO TUNING	YES (For AU)	NO
	AUTO SEEK	YES (For AU)	NO
	AUTO TAPE CANCELLER	YES	YES
REMOTE CONTROL	PROGRAMME SETTING	LCD	OSD
	CLOCK SETTING	LCD	OSD
	VCR1/VCR2/TV	YES	YES
	PROGRAMME MEMORY	YES	NO
	VIDEO PLUS+	YES	NO

COMPARISON OF MAIN CONTROL ICs

ITEM	VT-FX8000E/FX8000EM		VT-F99EM	
VIDEO SYSTEM				
Y/CHROMA PROCESS	JCP8016MSB	(IC0201)	HA118203F	(IC0201)
CCD DELAY	Included in IC201		MSM7470-70MS-KR1	(IC0202)
PRE/REC AMP				
AUDIO HEAD AMP	AN3329S	(IC1102)	LA7256	(IC1102)
VIDEO HEAD AMP	Included in IC201		HA118198F	(IC1101)
AUDIO				
FM AUDIO PROCESS	AN3964FB	(IC0501)	AN3964FB	(IC0501)
MAIN CONTROL				
MAIN µP (system control µP)	HD6433977SC20F	(IC0901)	HD6433977SB03F	(IC0901)
EEPROM	ST24C02-6	(IC0903)	ST24C02	(IC0903)
TAPE LOADING DRIVE	BA6209	(IC0904)	BA6209	(IC0904)
SERVO CONTROL	Included in Main µp		Included in Main µp	
NICAM (For (GKI)NA,HKN)				
NICAM DECORDER	TDA9874H	(IC1801)	SAA7283GP	(IC1801)
DUAL OPE. AMP	NJM4558M	(IC1802)	NJM4558M	(IC1802)
A2 (For AU)				
ST/DUAL SOUND PROCESSOR	TDA9840T	(IC1871)	TDA9840T	(IC1851)
FM DEMODULATOR	TDA9821	(IC1872)	TDA9821	(IC1852)
MPX AUDIO (For JU)				
MTS DECODER (USA)	HTS7342	(IC1801)	HTS7337A	(IC1801)
MPX DECODER (JAPAN)	CXA2020S	(IC1802)	CXA2020S	(IC1802)
USA/JAPAN SELECTOR	BA3129FT	(IC1803)	BA3129	(IC1803)
POWER SUPPLY				
SWITCHING DRIVER	STR-F6653	(IC0851)	FS3KM-18A	(Q0851)
TAPE NAVIGATION				
CCD µP (NAVI control)	M37272M8-122SP	(IC4301)	---------	
OSD	MB90089-214FP	(IC4101)	---------	
E²P ROM	AT24C16	(IC4302)	---------	
RESET	RN5VS45AA	(IC4303)	---------	
SYNC SEPARATER	MM1105XFFE	(IC4304)	---------	
VIDEO SW	NJM2249M	(IC4103)	---------	
VIDEO SW	NJM2535M	(IC4102)	---------	

TROUBLE DISPLAY FUNCTION

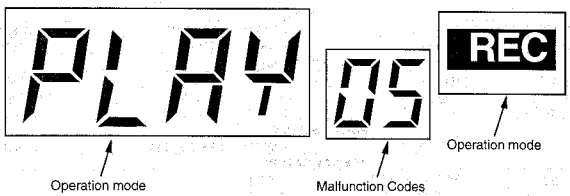
This VCR has a function which displays mechanism malfunctions, etc. in the LCD display. Use this function to analyze the cause when the power is shut off due to a malfunction, etc. in the mechanism.
Two types of information are displayed, 1) The operation mode when the malfunction occurred, 2)Malfunction Codes.

The details of the malfunction are displayed as follows.

PROCEDURE TO DISPLAY A MALFUNCTION

Press the (CH ▼) button on the VCR when the power is turned off and hold it; the malfunction code is displayed while the button is held depressed.

LCD DISPLAY



【Display of details of malfunction】

Displayed No.	Item	Details
" 0 0 "	No malfunction	
" 0 1 "	FL mechanism lock	Malfunction in insertion/ejection of cassette
" 0 2 "	Capstan lock	Malfunction of capstan motor drive during tape unloading
" 0 4 "	Reel lock	Reel rotation trouble when tape is running
" 0 6 "	Cylinder lock	Cylinder rotation malfanction
" 0 7 "	Loading mechanism lock	Malfunction in shifting mechanism mode
" 1 6 "	Servo lock	Shorting of 5V detected

【Mode Display when Malfunction Has Occurred】

Mode	Display	Mode	Display
Stop	No Display	Playback	PLAY
Fast forward	FF	Reverse playback	−PLAY
Rewind	REW	Forward search	SRCH
Hight speed fast forward	FF	Reverse search	−SRCH
Hight speed rewind	REW	Slow motion play	SLOW
Recording	REC	Reverse motion slow play	−SLOW
Recording pause	REC (flashes)	Still motion play	STILL

No symbols are displayed if the malfunction occurred when a cassette was inserted or ejected, or the power was switched on from off, and off from on.

How to Remove the Cassette when a Malfunction Has Occurred in the Mechanism

If a cassette is caught in the mechanism because of a malfunction in the mechanism, remove it by the following procedure.

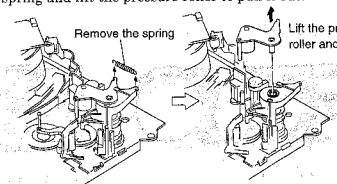
〔Work Procedure〕

1. Remove the top cover.
2. Remove the front panel.

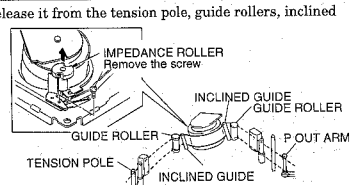
If the tape is wound round the cylinder in the loading state

If the cassette dose not come out from the FL mechanism in the unloading state.

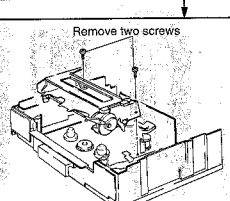
Remove the spring and lift the pressure roller to pull it out.



Slacken the tape and release it from the tension pole, guide rollers, inclined guides and P out arm.

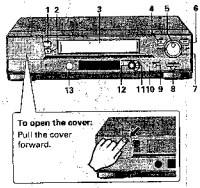


1) Remove two screws holding the FL mechanism.
2) Hold the cassette lid with your fingers so the tape is not damaged and remove the FL mechanism.
3) Remove the slack tape and eject the cassette.



CONTROLS AND FUNCTIONS

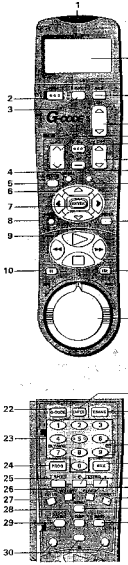
VCR Customer Controls



Item No.	Functions	Page
1	OPERATE (Operate/Standby) button	2
2	EJECT button	12
3	Cassette compartment	12
4	STOP button	16
5	Jog dial	20
6	PLAY/STILL button	16
7	Shuttle ring	20
8	CHANNEL (channel up/down) buttons	10
9	REC/IRT button	15
10	REC (record) indicator — lights during recording (including timer recording and IRT) and recording pause	14
11	Tape navigation programme select up/down buttons	–
12	TAPE NAVIGATION button	21
13	Remote control receiving window	8
14	Reset switch	38
15	AUDIO IN (L-mono),(R) socket	35
16	VIDEO IN socket	35
17	AUDIO IN (L),(R) socket	34
18	VIDEO IN socket	34
19	AERIAL input socket — signal input	5
20	RF OUT socket — signal out to TV	5
21	VIDEO OUT	–
22	AUDIO OUT (L), (R)	–
	VCR Display	
23	Colour System Indicator	–
24	Time, Time counter or VCR mode indicator ("–" appears during reverse direction viewing)	13, 17, 16, 16
	"PLAY" — playback	–
	"SRCH" — visual search	–
	"SLOW" — slow play	–
	"REW" — rewind	–
	"SREW" — high speed rewind	–
	"FF" — fast forward	–
	"SFF" — high speed fast forward	–
	"STILL" — play pause and frame advance	–
25	Audio indicators	19,
26	REC — record (flashes during record pause)	15
27	Tape-in indicator	12
28	TV programme number display or Auxiliary (L1 or L2)	14, 34
29	Timer indicator	31

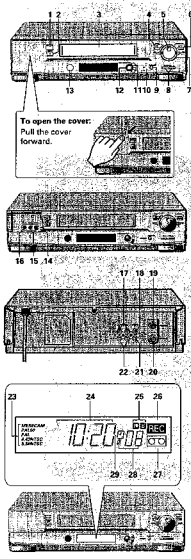
REMOTE OPERATION

Remote Control Handset Customer Controls



Item No.	Functions	Page
1	Transmission window	8
2	OPERATE — switch between operate and standby mode	2
3	EJECT button	12
4	MENU — to recall OSD menu	10
5	NAVI button	21
6	Cursor buttons	10
7	ENTER button	10
8	REC — record button	14
9	Tape transport button	
	Play ▷ — playback	16
	Rewind ◁◁ — fast rewind or search	18
	Fast Forward ▷▷ — fast forward or search	18
	Stop □ — stops play/record function	16
10	Pause/still button	17
11	Shuttle knob	20
12	Frame advance during still	18
13	INDEX button — INDEX feature	18
14	C.C. button	25
15	TV mute button (Buttons used exclusively to operate the TV)	37
16	TV CH button	37
17	TV Operate button	37
18	TV volume buttons	37
	Note: Four buttons 15 – 18 are used only when operating the TV.	
19	CH (channel up/down) button	10
20	AUX button — select L1 or L2 input	34
21	Display clock/timer programme information	13
22	G-code programming buttons	29
23	Number buttons	19
24	PROG — to enter timer programme information	32
25	T. SPEED button	14
26	VCR1/2/TV select button	8
27	CH1/2 button	19
28	DISP — to recall on-screen display	17
29	CLOCK/COUNT — changes VCR display	17
30	These buttons are not used	–
31	0000 — clears time counter	17
32	MENU — to recall OSD menu	10
33	CORRECT button	13
34	CLOCK — enter or correct time on handset	13
35	⏲ EXTEND (+ or +)	37
36	AUX — to select L1 or L2 input	32
37	CL buttons — mode lock	18
38	TRANS button—transmits data	13
39	ENTER button— to enter G-code number	30

VCR Customer Controls



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	"SRCH" — visual search	—
	"SLOW" — slow play	—
	"REW" — rewind	—
	"SPEED" — high speed rewind	—
	"FF" — fast forward	—
	"SPEED" — high speed fast forward	—
	"STILL" — play pause and frame advance	—
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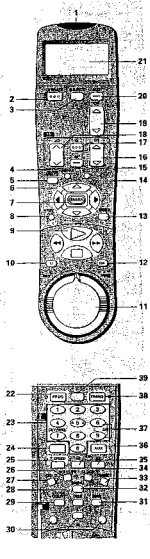
29	Timer indicator	30

Remote Control Handset Customer Controls



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15	TV mute button — Buttons used	35
16	TV CH button — exclusively to	35
17	TV Operate button — operate the TV	35
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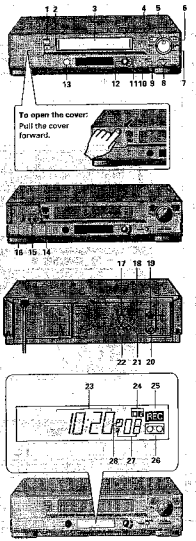
30	These buttons are not used	—
31	0000 — clears time counter	17
32	MENU — to recall OSD menu	10
33	CORRECT button	13
34	CLOCK — enter or correct time on handset	13
35	TV (1 < or 2 >)	35
36	AUX — to select L1 or L2 input	30
37	CL buttons — mode lock	18
38	TRANS button — transmits data	13
39	This button is not used	—

CONTROLS AND FUNCTIONS

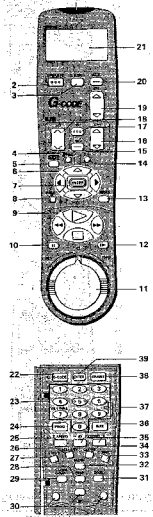
VCR Customer Controls



Ref. No.	Function	Page
1	OPERATE (Operate/Standby) button	2
2	EJECT button	11
3	Cassette compartment	11
4	STOP button	15
5	Jog dial	19
6	PLAY/STILL button	15
7	Shuttle ring	19
8	CHANNEL (channel up/down) buttons	9
9	REC/RT button	14
10	REC (record) indicator — lights during recording (including timer recording and (RT) and recording pause	13
11	Tape navigation programme select up/down buttons	–
12	TAPE NAVIGATION button	20
13	Remote control receiving window	7
14	Reset switch	37
15	AUDIO IN (L-mono), (R) socket	34
16	VIDEO IN socket	34
17	AUDIO IN (L), (R) socket	33
18	VIDEO IN socket	33
19	AERIAL input socket— signal input	4
20	RF OUT socket — signal out to TV	4
21	VIDEO OUT	–
22	AUDIO OUT (L), (R)	–
	VCR Display	–
23	Time, Time counter or VCR mode indicator ("–" appears during reverse direction viewing)	– 18 15 16 – – – – – –
	"PLAY" — playback	
	"SEARCH" — visual search	
	"SLOW" — slow play	
	"REW" — rewind	
	"SPEED" — high speed rewind	
	"FF" — fast forward	
	"SET" — high speed fast forward	
	"STILL" — play pause and frame advance	
24	Audio indicators	18
25	REC — record (flashes during record pause)	13
26	Tape-in indicator	11
27	TV programme number display or Auxiliary (L1 or L2)	13 33
28	Timer indicator	31

REMOTE OPERATION

Remote Control Handset Customer Controls



Ref. No.	Function	Page
1	Transmission window	7
2	OPERATE — switch between operate and standby mode	2
3	EJECT button	11
4	MENU — to recall OSD menu	8
5	NAVI button	20
6	Cursor buttons	8
7	ENTER button	8
8	REC — record button	13
9	Tape transport button	
	Play ▷ — playback	15
	Rewind ◀◀ — fast rewind or search	17
	Fast forward ▶▶ — fast forward or search	17
	Stop □ — stops play/record function	15
10	Pause/still button	16
11	Shuttle knob	19
12	Frame advance during still	17
13	INDEX button — INDEX feature	17
14	C.C. button	24
15	TV mute button (Buttons used exclusively to operate the TV)	36
16	TV CH button	36
17	TV Operate button	36
18	TV volume buttons	36
	Note: Four buttons 15 – 18 are used only when operating the TV.	
19	CH (channel up/down) button	9
20	AUX button — select L1 or L2 input	33
21	Display clock/timer programme information	12
22	G-code programming button	29
23	Number buttons	12
24	PROG — to enter timer programme information	31
25	T.SPEED button	13
26	VCR1/2/TV select button	7
27	CH1/2 button	18
28	DISP — to recall on-screen display	16
29	CLOCK/COUNT — changes VCR display	16
30	These buttons are not used	—
31	0000 — clears time counter	16
32	MENU — to recall OSD menu	8
33	CORRECT button	12
34	CLOCK — enter or correct time on handset	12
35	⊕EXTEND (– or +)	36
36	AUX — to select L1 or L2 input	31
37	CL button — mode lock	18
38	TRANS button — transmits data	12
39	ENTER button — to enter G-code number	29

CHAPTER 2 DISASSEMBLY

1. Before Starting Disassembly

1) Unplug the power cord from the AC outlet.
2) [Removal procedure]
If a special procedure is required when dismantling any component, it is indicated using numbers. Follow the numbers ((1),(2),(3) ...) shown in the illustrations.
[Reinstallation procedure]
Reinstall each component in the reverse order to removal when otherwise not specified.
3) Insert card connectors securely all the way as they are of the direct insertion type.

Identifications of Circuit Boards

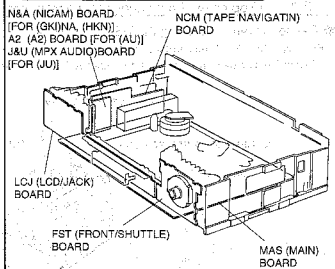


Fig.1-1

2. Disassembly Method

When replacing defective parts, first refer to the "Parts hierarchy chart" shown below. This chart shows the procedure for parts removal when replacing defective parts.

[How to use the parts hierarchy chart]
(1) Locate the part to be replaced.
(2) Check the parts in the ranks above the part to be replaced and start dismantling.
(3) Replace the defective part and reinstall the parts in the reverse order to that shown in the parts hierarchy chart.

Parts Hierarchy Chart

Note: Dismantle parts in the eject state.

Parts to remove	Item
Top cover	2-1
Front panel	2-1
Bottom cover	2-1
Rear panel	2-1
US-FL mechanism	2-1
NCM and N&A, A2 or J&U boards	2-4
US mechanism/ MAS board assembly	2-5

Parts to remove	Item
Cassette door	2-2
Buttons	2-2
Front frame	2-3
LCJ and FST board	2-3
US mechanism	2-6

Item	Parts to remove
2-1	Top cover, front panel, rear panel, bottom cover and US-FL mechanism

◆ Caution when reinstalling the US-FL mechanism

Reinstall the US-FL mechanism in the state that the cassette holder is pulled forward. (Otherwise, the switch arm could damage the FL switch on the MAS board.)

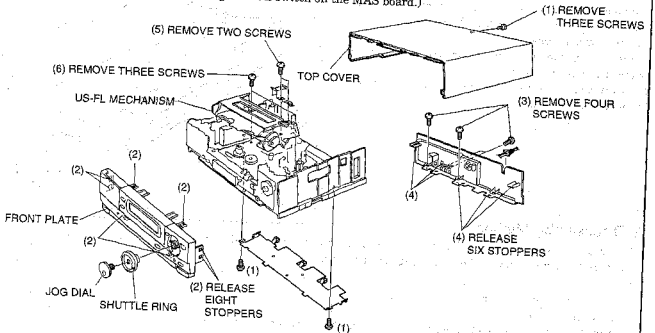


Fig. 2-1

2-2	Cassette door and buttons

◆ Caution when reinstalling the front panel

Reinstall the front panel in the state the cassette door is pushed so the boss of the door arm comes to the front of the boss support of the cassette door.

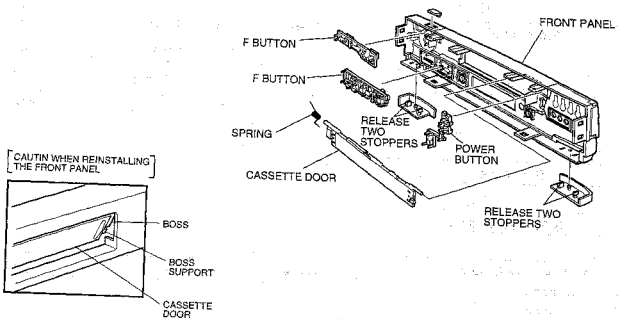


Fig. 2-2

Item	Parts to remove
2-3	Front frame, LCJ and FST boards

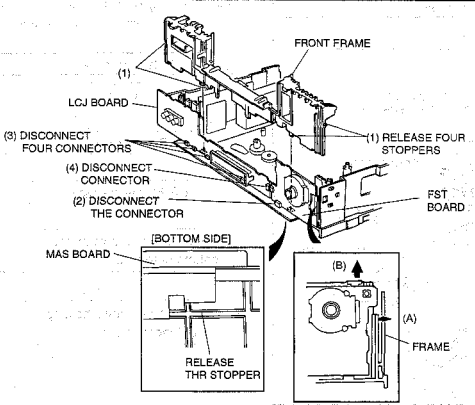


Fig. 2-3

2-4	NCM and N&A, A2 or J&U boards

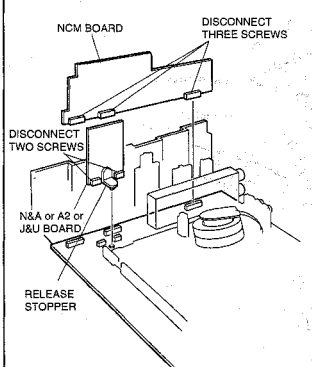


Fig. 2-4

2-5	US machanism and MAS board assembly

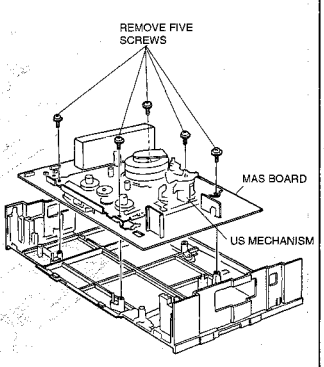


Fig. 2-5

Item	Parts to remove
2-6	Separation of MAS board from US mechanism

[Rear of the mechanism]

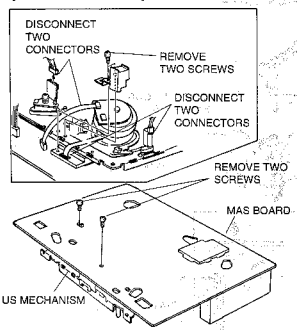


Fig. 2-6

Procedure to remove only the US mechanism

With this VCR the US mechanism can be removed without removing the MAS board. This is done by a different method from the normal disassembly method.

Parts to remove	Item
Top cover	2-1
⇩	
Front Panel	2-1
⇩	
US-FL mechanism	2-1
⇩	
Remove two screws on the bottom of the VCR.	2-7
⇩	
Remove five screws holding the US mechanism.	2-7

2-7	Procedure to remove only the US mechanism

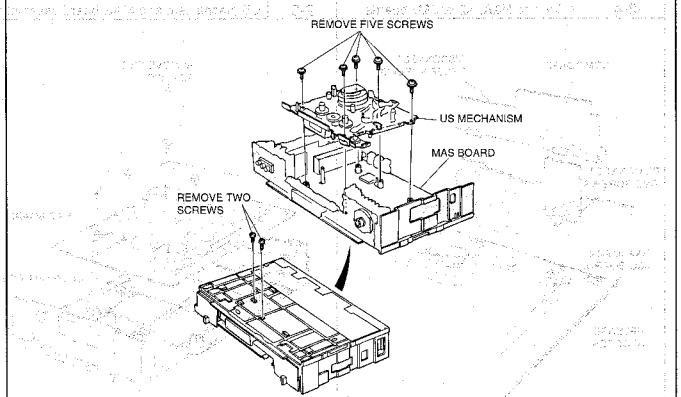


Fig. 2-7

Cautions When Reinstalling the US Mechanism

This VCR has mechanism sensors on the MAS board and the capstan and loading motors are connected via direct connectors. Therefore, when reinstalling the US mechanism, observe the following cautions.

1) Align the ▽ mark and mode no. 1 of the mechanism state switch on the MAS board. (Mode no. 1 of the mechanism state switch has a click position.)

2) Check that mode no. 1 on the P drive gear in the mechanism and the ▽ mark of the spring hook are aligned. If they are not aligned, turn the loading motor pulley to align them.

3) Pass the end LED through the hole in the mechanism and install the mechanism from immediately above using the installation position holes as reference. Check that the boss of the mechanism state switch and the hole in the cam gear are aligned.

4) Push the terminal sections (shaded sections ▨) of the capstan and loading motors and check that they are inserted securely.

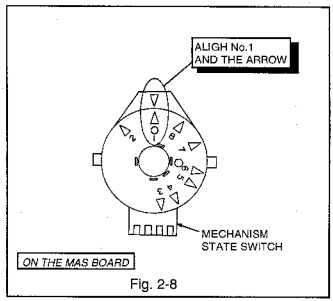


Fig. 2-8

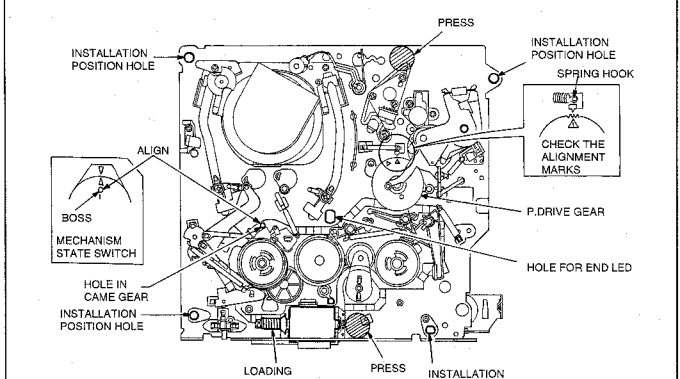


Fig. 2-9

MEMO

CHAPTER 3 ELECTRIC CIRCUIT ADJUSTMENT AND TROUBLE DISPLAY

Service Positions

1. Servicing position during electrical adjustment

Perform adjustment after removing the top cover, front panel and rear panel.

When the shield cover of the connector between the cylinder motor and MAS circuit boards is removed, noise appears in the played back picture. Attach the shield cover when checking the picture on the screen.

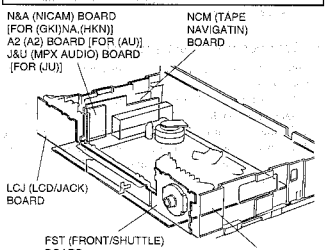


Fig. 1

2. Servicing positions when repairing and checking circuits

2-1. Procedure to set the LCJ, FST,NCM and N&A, A2 or J&U boards to the servicing positions (Fig. 2)

1) Remove the top cover, front panel and rear panel.
2) Remove the US-FL mechanism.
3) Remove the front frame and open each board as shown in the diagram below and perform check from the patterm side (indicated by the arrow).

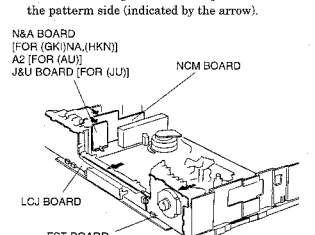


Fig. 2

2-2. Procedure to set the MAS board to the servicing position (Fig. 3)

1) Remove the top cover, front panel and rear panel.
2) Remove the US-FL mechanism and front frame.
3) Remove the MAS board, with each board and the US mechanism assembled on it, from the frame.
4) Turn over the MAS board and perform checks from the pattern side (indicated by the arrow).
   Take care of the following at this time.
   · Lay the insulation sheet under the boards.
   · Attach the US-FL mechanism when loading a tape.

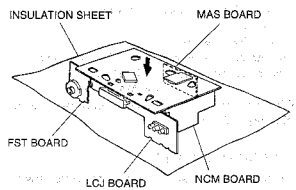


Fig. 3

3. Be careful of electric shocks

The power supply block on the right of the VCR has a heat sink which generates a high voltage. "HIGH VOLTAGE" is printed on the heat sink. Take great care when handling this heat sink when the power is turned on during servicing.

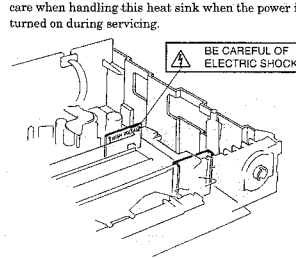


Fig. 4

1. Test equipment/jigs necessary for adjustment

1) Dual-trace oscilloscope
2) Colour bar generator
3) Voltmeter
4) Monitor TV (with A/V jacks)
5) Alignment tapes:
   MH-2: Part No. 7099052
   24HMAF-2: Part No. 7099175
   (Hi-Fi alignment tape)
6) Blank tape
7) C/R oscillator

2. Cautions on adjustment

1) The following conditions apply when otherwise not specified.
   Probe of oscilloscope: 10:1
   Synchronization of oscilloscope: Internal sync
   Ground of test equipment: PG2508 pin 6
   (on MAS board)
2) When performing more than one adjustment, follow the specified order.

3. Tips for adjustment

3-1. Procedure to reset the main microprocessor

The main microprocessor is not reset even when the power cord is unplugged from the AC outlet because its power is backed up by a backup circuit. Press S708 on the MAS board to reset the entire microprocessor. Do not press the reset switch with the power cord unplugged from the AC outlet as the slow tracking preset value could drift. If the preset value drifts, plug the power cord into an AC outlet and press the reset switch again with the power turned on. It is recommended that you press the reset switch after reinstalling the front panel.

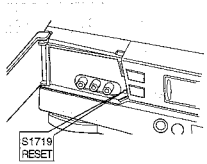


Fig. 5

3-2. Procedure to switch off the blue background function

1) Press the "MENU" button of the remote control to display the menu on the monitor TV screen.
2) Press Cursor button to select the VCR setup screen.
3) Press Cursor button to specify blue background off.

3-3. Procedure to obtain the LP head playback mode (X-value adjustment test mode)

Press the CH UP(▲) and DOWN(▼) buttons of the remote control provided simultaneously when an alignment tape is being played and hold them, then press the "CHANNEL ▽" button on the VCR; The VCR enters the LP head playback mode (X-value adjustment test mode).

4. Connections of test equipment

Connect the test equipment as follows when otherwise not specified.
1) Connect a colour bar generator to the video input jack of the VCR.
2) Connect a monitor TV to the Euro Socket of the VCR.
3) Connect an antenna to the antenna jack and receive a TV broadcast (only for sound multiplex adjustment).

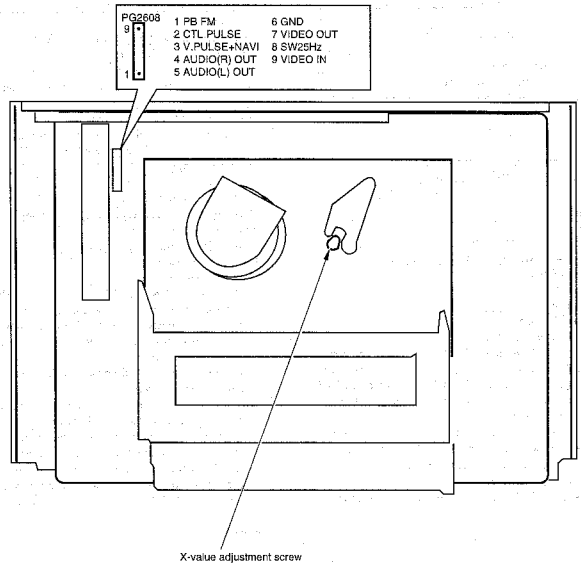


Fig. 6 MAS (Main) Circuit Board [Components Side]

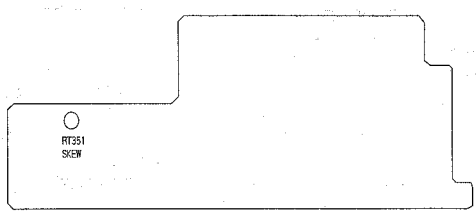


Fig. 7 NCM (Tape Navigation) Circuit Board [Components Side]

6. Servo Circuit Adjustments

6-1. Switching point adjustment (Fig. 6)

Purpose:

To set the switching point of the video heads during playback to the center where the CH-1 and CH-2 envelopes overlap each other.

Fault due to incomplete adjustment:

Vertical sync signal is degraded and vertical jitter occurs.

Switching noise appears across the bottom of the screen.

Test Equipment/Jigs and Connection Points

Oscilloscope CH-1: Video out jack
CH-2: PG2508-8(SW25Hz)

Alignment tape (MH-2)

State of VCR

1) Play the alignment tape
2) Set to the X-value adjustment test mode.

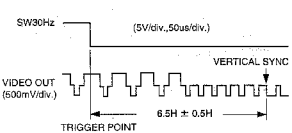
Adjustment Point

F.FWD button
REW button

Adjustment Procedure

1) Play the alignment tape.
2) Press the "CH ▲"and "CH ▼" buttons of the remote control provided simultaneously and hold them, then press the "CHANNEL ▽ "(S2709) button of the VCR to set the VCR to the test mode. (SP is switched to LP in the display.)
3) Press the "F.FWD"and "REW" buttons of the remote control so the phase from the vertical sync to the trailing edge (trigger position) of the SW25Hz pulse is set to 6.5H ± 0.5H.
4) Press the "STOP" button to release the test mode.

Waveforms



<Conditions of oscilloscope>
Trigger with CH-2.
Set the sync slope to "-".

6-2. X-value adjustment (Fig. 6)

Purpose:

To ensure compatibility with other VCRs.

Fault due to incomplete adjustment:

When a tape recorded by another VCR is played back, the tracking is not optimized and noise appears on the screen.

Test Equipment/Jigs and Connection Points

Oscilloscope CH-1: PG2508-1 (PB FM)
CH-2: PG2508-8 (SW25Hz)

Alignment tape (MH-2)

State of VCR

1) Play the alignment tape.
2) Set to the X-value adjustment test mode.

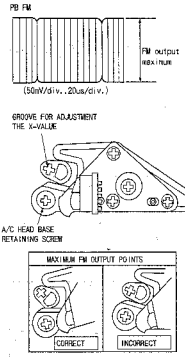
Adjustment Point

Groove for the adjustment X-value

Adjustment Procedure

1) Play the alignment tape.
2) Press the "CH ▲ "and "CH ▼ " buttons of the remote control provided simultaneously and hold them, then press the "CHANNEL ▽ "(S2709) button of the VCR to set the VCR to the test mode. (SP is switched to LP in the display.)
3) Loosen the screw holding the A/C head base (do not loosen it excessively).
4) Insert a screwdriver into the groove for adjusting the X-value and adjust so the FM output is maximum. There are two maximum FM output points when the groove for adjusting the X-value is turned. Adjust the FM output to a maximum when the groove is at the correct position as shown in the figure below.
5) Press the "STOP" button to release the test mode.

Waveforms



6-3. Vertical jitter adjustment

Purpose:
To suppress vertical jitter during slow and still play.

Fault due to incomplete adjustment:
Vertical jitter appears in the picture during slow and still play.

Test Equipment/Jigs and Connection Points
Monitor TV : Video output jack
Color bar generator: Video input jack
Blank tape

State of VCR
Record a color bar signal and play it using the same VCR.

Adjustment Point
CH ▲ (Remote control)
CH ▼ (Remote control)

Adjustment Procedure
<LP vertical jitter correction>: Record in the LP mode and play it back using the same VCR.
1) Press the "PAUSE" button to set the VCR to the still play mode.
2) Use the "CH ▲" or "CH ▼" buttons of the remote control to suppress vertical jitter of the picture.

<SP vertical jitter correction>: Record in the SP mode and play it back using the same VCR.
1) Press the "PAUSE" button to set the VCR to the still play mode.
2) Use the "CH ▲" or "CH ▼" buttons of the remote control to suppress vertical jitter in the picture.

6-4. Forward slow tracking preset adjustment

Purpose:
To adjust the timing with which the brake pulse of the capstan motor is generated during slow play so that noise is minimum.

Fault due to incomplete adjustment:
Noise appears during slow play and the picture is not clear.

Test Equipment/Jigs and Connection Points
Monitor TV : Video output jack
Color bar generator: Video input jack
Blank tape (E-180)

State of VCR
Slow tracking: Unplug the power cord to set the slow tracking to the center.

Adjustment Point
CH ▲ (Remote control)
CH ▼ (Remote control)

Adjustment Procedure
1) Record a signal on the middle of a E-180 blank tape in the LP mode and play it back using the same VCR.
2) Press the "CH ▲" and "CH ▼" buttons of the remote control (provided) simultaneously during playback and hold them, then press the "PLAY" button (S2701) to set the VCR to the forward test slow mode.
3) Use the "CH ▲" or "CH ▼" buttons so the slow feed noise appears across the bottom of the monitor screen and then it is driven out from the bottom of the screen.
4) Check that no noise appears on the monitor screen.
5) Press the "PLAY" button to return the VCR to the playback mode (the preset data is written to the EEPROM).
6) Perform the same procedure to perform slow tracking preset adjustment in the SP mode.
Do not press the reset switch after adjustment when the power is not turned on as the preset value could drift. If the preset value drifts, turn the power on and press the reset switch again for recovery.

6-5. Reverse slow tracking preset adjustment

Purpose:
To adjust the timing with which the brake pulse of the capstan motor is generated during reverse slow play so that noise is minimum.

Fault due to incomplete adjustment:
Noise appears during reverse slow play and the picture is not clear.

Test Equipment/Jigs and Connection Points
Monitor TV : Video output jack
Color bar generator: Video input jack
Blank tape (E-180)

State of VCR
Slow tracking: Unplug the power cord to set the slow tracking to the center.

Adjustment Point
CH ▲ (Remote control)
CH ▼ (Remote control)

Adjustment Procedure
1) Record a signal on the middle of a E-180 blank tape in the LP mode and play it back using the same VCR.
2) Press the "CH ▲" and "CH ▼" buttons of the remote control (provided) simultaneously during still play and hold them, then press the "PLAY" button (S2701) to set the VCR to the reverse test slow mode.
3) Use the "CH ▲" or "CH ▼" buttons so the slow feed noise appears across the bottom of the monitor screen and then it is driven out from the bottom of the screen.
4) Check that no noise appears on the monitor screen.
5) Press the "PLAY" button to return the VCR to the playback mode (the preset data is written to the EEPROM).
6) Perform the same procedure to perform reverse slow tracking preset adjustment in the SP mode.
Do not press the reset switch after adjustment when the power is not turned on as the preset value could drift. If the preset value drifts, turn the power on and press the reset switch again for recovery.

7. Audio Circuit Adjustments

7-1. Hi-Fi audio playback level check

Purpose:
To set the playback level of the Hi-Fi audio signal to the specified value.

Fault due to incomplete adjustment:
The appropriate volume cannot be obtained during playback.

Test Equipment/Jigs and Connection Points
Voltmeter: When checking L-CH:PG2508-5
When checking R-CH:PG2508-4
Hi-Fi alignment tape (24HMAF-2)

State of VCR
Play Hi-Fi alignment tape.

Adjustment procedure
Use the same checking procedure for both the L and R channels.
Check that the voltmeter reads -7.8dBs ± 3.0dBs.
If it cannot be confirmed, check the playback signal system.

7-2. E-E audio level check

Purpose:
To check the audio level in the E-E mode.

Fault due to incomplete adjustment:
To sound is abnormal in the E-E mode.

Test Equipment/Jigs
1) C/R oscillator: Audio in jack(L-CH)
Audio in jack(R-CH)
2) Voltmeter: Audio out jack(L-CH)
Audio out jack(R-CH)

State of VCR
E-E mode

Adjustment procedure
1) Apply a 1kHz, -7.8dBs sinewave signal to the audio input 1 (L-CH and R-CH).
2) Check that the voltmeter reads -6.8dBs±2.0dBs.
3) If the above cannot be confirmed, check the E-E audio line.

8. Tape Navigation Circuit Adjustments

8-1. Skew adjustment

Purpose:
To minimize the flicker on the screen.

Fault due to incomplete adjustment:
Skew or fliking occurs on screen causing the picture to be distored.

Test Equipment/Jigs and Connection Points
Voltmeter Monitor TV: Video output
Alignment tape (HM-2)

State of VCR
Play back alignment tape (color bar section)
Adjustment Point RT351

Adjustment procedure
Adjust RT351 to minimize flicker on the TV screen.7-2.

9. MPX Audio Circuit Adjustments (For JU)

9-1. MPX separation adjustment

Purpose:
To set the playback level of the Hi-Fi audio signal to the specified value.

Fault due to incomplete adjustment:
The appropriate volume cannot be obtained during playback.

Test Equipment/Jigs and Connection Points
Voltmeter When checking L-CH:Audio output (L) jack
When checking R-CH:Audio output (R) jack
Hi-Fi alignment tape (24HMAF-2)

State of VCR
Play Hi-Fi alignment tape.

Adjustment Point
RT1802

Adjustment procedure
Use the same checking procedure for both the L and R channels.
Check that the voltmeter reads -7.8dBs ± 3.0dBs.
If it cannot be confirmed, check the playback signal system.

9-2. MTS input level adjustment

Purpose:
To set the level of the MTS signal supplied to the MTS processor in IC1801 from the tuner/IF to the specified level.

Fault due to incomplete adjustment:
The S/N deteriorates or distortion becomes conspicuous.
Stereo separation deteriorates.

Test Equipment/Jigs Connection Points
MTS sound signal generator: IN FORM ANT
Voltmeter: TP1801

State of VCR
E-E mode

Adjustment Point
RT1801

Adjustment procedure
1) RT1801: Set the reading of the voltmeter to -20.0dBs±0.5dBs.

Notes:
MTS sound signal generator settings:
Audio frequency: 300Hz
Modulation signal:L+R
Monitor TV settings:
1) Press the "GUIDE" button of the remote control to display the munu on the monitor TV screen.
2) Press 2 of the remote control.
3) Press 6 of the remote control to select the SAP option and switch it from OFF to ON.

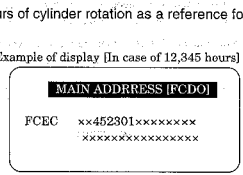
10. Cylinder Rotation Accumulated Hours of Usage Display

Display

This VCR has a function which displays the accumulated hours of cylinder rotation as a reference for replacing the cylinder.

1. Method for display
simultaneously holding down the "VCR channel ▲" and "VCR channel ▼" buttons on the provided remote control, with power ON and without a cassette inserted, press the "channel up" button on the VCR. To disappear the display, turned off the power.
2. Clearing the accumulated hours
Same as for shipment mode initial setting.

3. Example of display [In case of 12,345 hours]



VCR DISPLAY

11. List of Data in EEPROM and Initial Settings

The table below lists the data stored in ROM. It also shows the data set by shipment mode initialization, when the trouble display is cleared.

Information	Data memory ROM		List of initial data			Remarks
	IC903 VCR EEPROM	IC4302 NAVI EEPROM	Shipment mode initial data	Tape navi, map initial data	Clearing of trouble display	
Channel memory	Yes	No	Yes	No	No	
VCR mode select data	Yes	No	Yes	No	No	
Trouble display data	Yes	No	Yes	No	Yes	
Slow tracking data	Yes	No	No (set by adj.)	No	No	
Artificial V sync data	Yes	No	No (set by adj.)	No	No	
Switching point data	Yes	No	No (set by adj.)	No	No	
Tape navigation map data	No	Yes	No	Yes	No	

12. List of Hidden Commands

The following tables list the mode setting commands during adjustment and EEPROM initial setting commands.

12-1. Mode setting commands during adjustment

Item	Mode in which command is accepted	Operation	Remarks
Tracking center	Play	Press the CH up(▲) and down(▼) buttons of the remote control simultaneously.	
X-value adjustment test mode	Play	Press the CH up(▲) and down(▼) buttons of the remote control simultaneously and press the "CHANNEL ▽ "button on the VCR.	
Forward test slow mode	Play	Press the CH up(▲) and down(▼) buttons of the remote control simultaneously and press the "PLAY" button on the VCR.	
Reverse test slow mode	Still play	Press the CH up(▲) and down(▼) buttons of the remote control simultaneously and press the "PLAY" button on the VCR.	

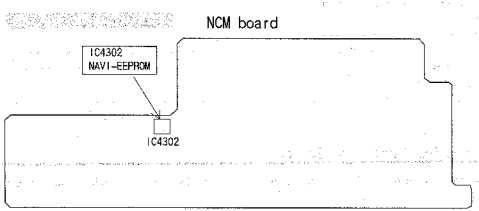
12-2. EEPROM initialization commands

Item	Mode in which command is accepted	Operation	Remarks
Shipment mode initial setting	EJECT	Press the "REC" buttons on the VCR and hold it, then press the "RESET" button used to initialize the microprocessor.	Hold the "REC" button depressed and release it after the display lights.
Clearing of trouble display	_____	Press the "PLAY" button on the VCR and hold it, then press the "RESET" button used to initialize the microprocessor.	Hold the "PLAY" button depressed and release it after the display lights.

13. Caution When Handling IC4302 (NAVI EEROM)

The navigation map data of the tapes on which the customer has made recordings is stored in IC4302 (NAVI EEPROM). When the CFN board is replaced, etc. during servicing, remove the ROM from the new board and install the ROM from the repaired product. Do not initialize the tape map information at this time.

Caution: Do not initialize the tape map data except when replacing IC4302 (NAVI EEPROM) due to a defect, etc. in this memory IC. Otherwise the tape navigation data stored by the customer will be erased.



14. Caution When Replacing IC903 (EEPROM)

After replacing IC903 (EEPROM), execute the VCR initial settings and then perform the following adjustments.

	Adjustment	Page
1	Switching point adjustment	P3-4
2	Vertical jitter adjustment	P3-5
3	Forward slow tracking adjustment	P3-5
4	Reverse slow tracking adjustment	P3-5

TROUBLE DISPLAY FUNCTION

This VCR has a function which displays mechanism malfunctions, etc. in the LCD display. Use this function to analyze the cause when the power is shut off due to a malfunction, etc. in the mechanism.
Two types of information are displayed, 1)The operation mode when the malfunction occurred, 2)Malfunction Codes.

The details of the malfunction are displayed as follows.

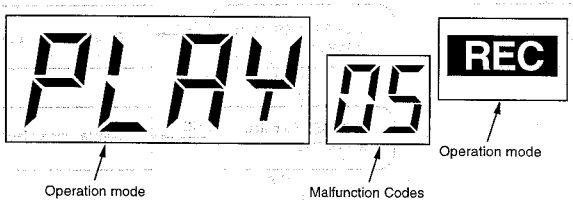
Procedure to display a malfunction

Press the (CH ▼) button on the VCR when the power is turned off and hold it; the malfunction code is displayed while the button is held depressed.

Procedure to clear the malfunction display

Press the "PLAY" button on the VCR and hold it, then press the microprocessor "RESET" button to initialize the trouble display.

LCD DISPLAY



【Display of details of malfunction】

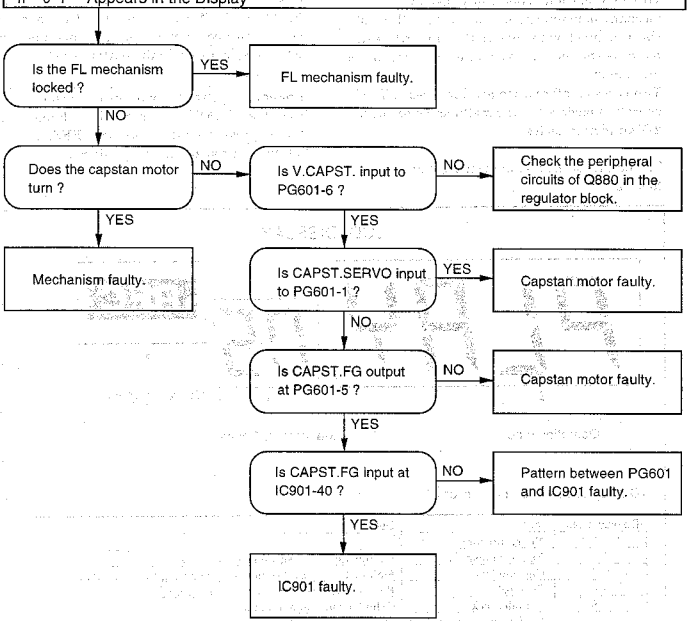
Displayed No.	Item	Details
" 0 0 "	No malfunction	
" 0 1 "	FL mechanism lock	Malfunction in insertion/ejection of cassette
" 0 2 "	Capstan lock	Malfunction of capstan motor drive during tape unloading
" 0 4 "	Reel lock	Reel rotation trouble when tape is running
" 0 6 "	Cylinder lock	Cylinder rotation malfanction
" 0 7 "	Loading mechanism lock	Malfunction in shifting mechanism mode
" 1 6 "	Servo lock	Shorting of 5V detected

【Mode Display when Malfunction Has Occurred】

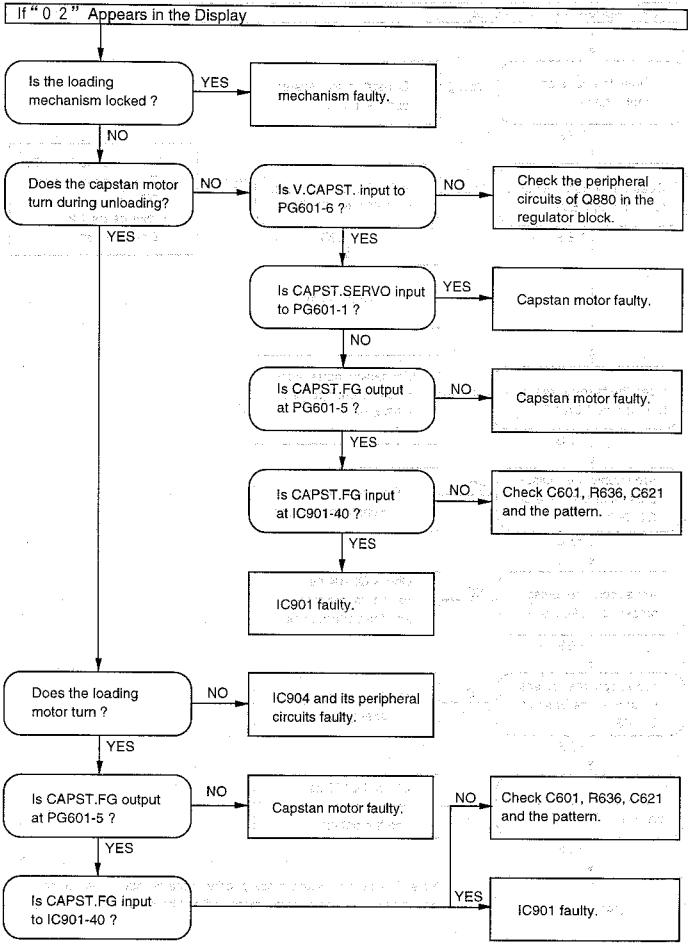
Mode	Display	Mode	Display
Stop	No Display	Playback	PLAY
Fast forward	FF	Reverse playback	−PLAY
Rewind	REW	Forward search	SRCH
Hight speed fast forward	FF	Reverse search	−SRCH
Hight speed rewind	REW	Slow motion play	SLOW
Recording	REC	Reverse motion slow play	−SLOW
Recording pause	REC (flashes)	Still motion play	STILL

No symbols are displayed if the malfunction occurred when a cassette was inserted or ejected, or the power was switched on from off, and off from on.

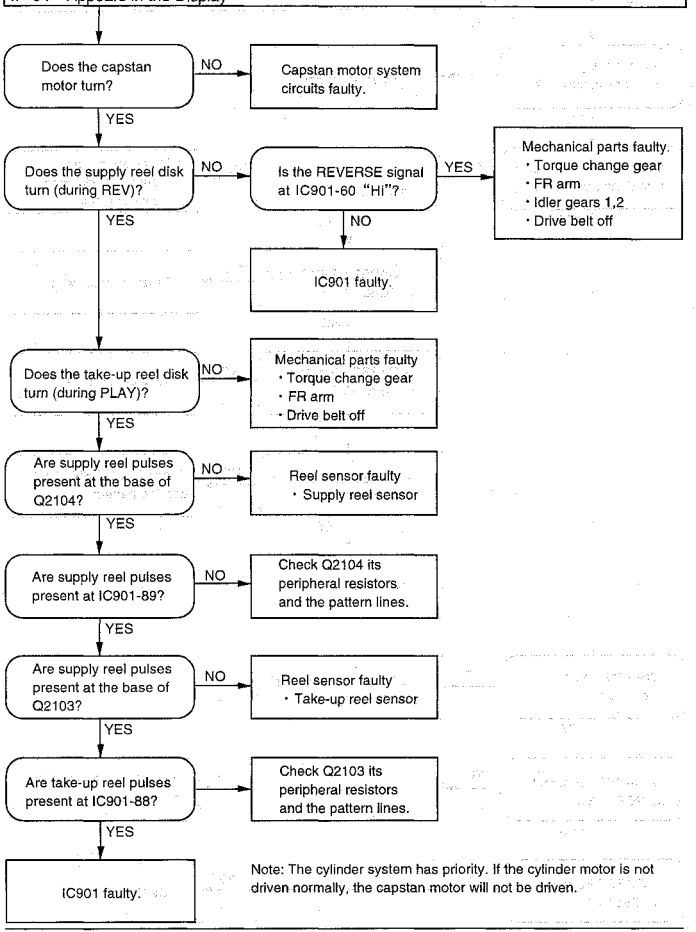
If " 0 1 " Appears in the Display



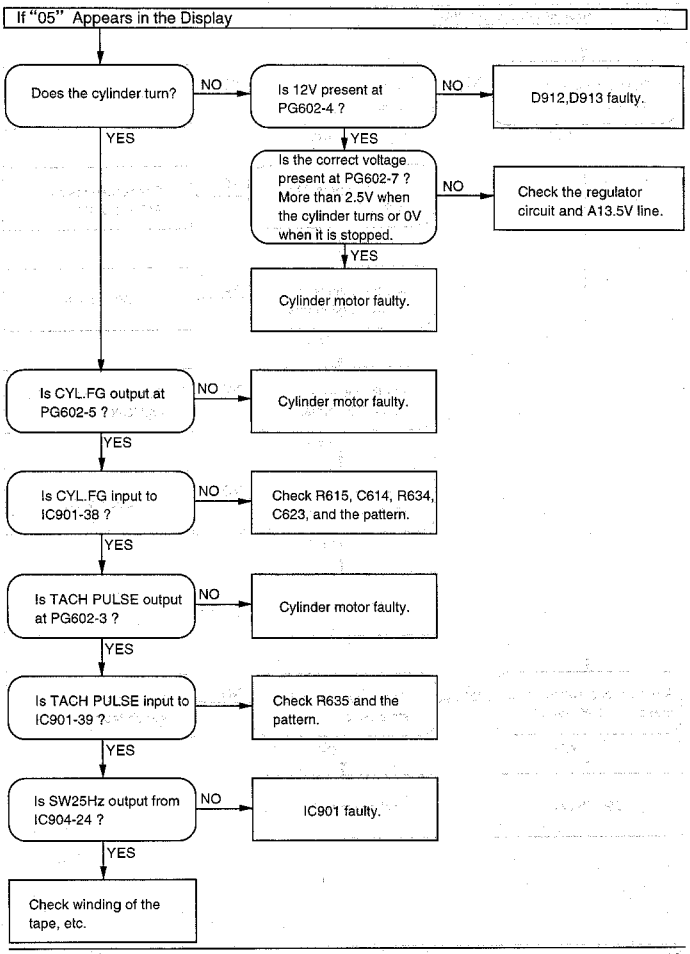
If " 0 2 " Appears in the Display

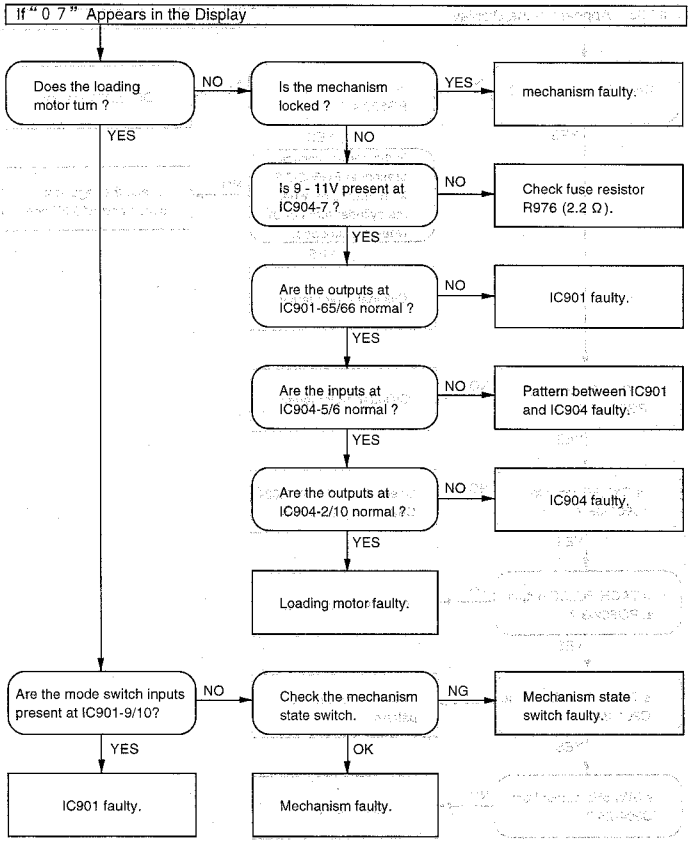


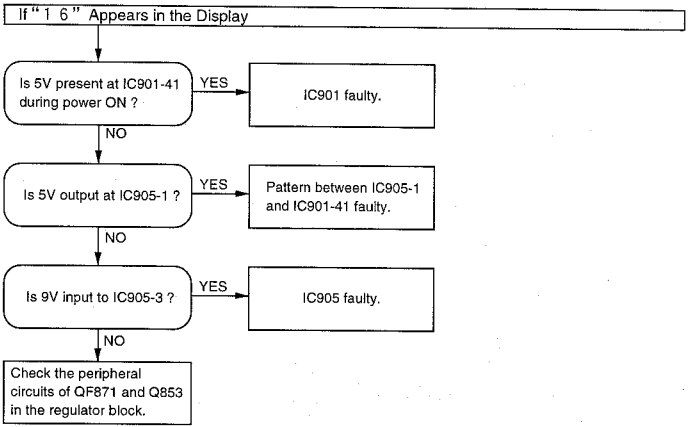
If "04" Appears in the Display

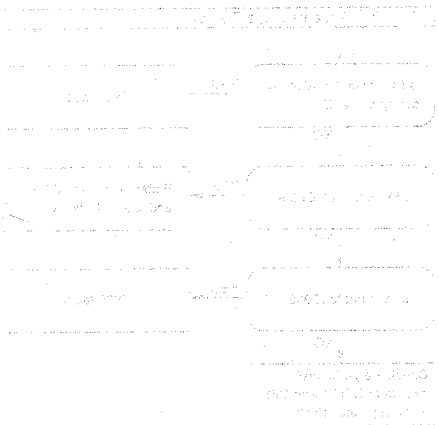


Note: The cylinder system has priority. If the cylinder motor is not driven normally, the capstan motor will not be driven.


If "05" Appears in the Display
Does the cylinder turn?
NO
Is 12V present at PG602-4 ?
NO
D912,D913 faulty.
YES
YES
Is the correct voltage present at PG602-7 ? More than 2.5V when the cylinder turns or 0V when it is stopped.
NO
Check the regulator circuit and A13.5V line.
YES
Cylinder motor faulty.
Is CYL.FG output at PG602-5 ?
NO
Cylinder motor faulty.
YES
Is CYL.FG input to IC901-38 ?
NO
Check R615, C614, R634, C623, and the pattern.
YES
Is TACH PULSE output at PG602-3 ?
NO
Cylinder motor faulty.
YES
Is TACH PULSE input to IC901-39 ?
Check R635 and the pattern.
YES
Is SW25Hz output from IC904-24 ?
NO
IC901 faulty.
YES
Check winding of the tape, etc.

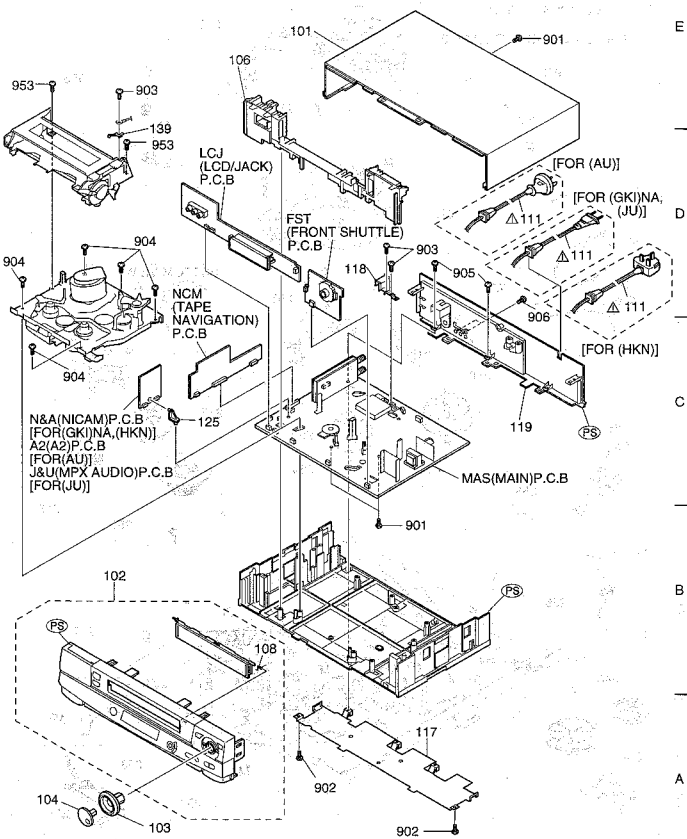

If " 0 7 " Appears in the Display
Does the loading motor turn ?
NO
Is the mechanism locked ?
YES
mechanism faulty.
YES
NO
Is 9 - 11V present at IC904-7 ?
NO
Check fuse resistor R976 (2.2 Ω).
YES
Are the outputs at IC901-65/66 normal ?
NO
IC901 faulty.
YES
Are the inputs at IC904-5/6 normal ?
NO
Pattern between IC901 and IC904 faulty.
YES
Are the outputs at IC904-2/10 normal ?
NO
IC904 faulty.
YES
Loading motor faulty.
Are the mode switch inputs present at IC901-9/10?
NO
Check the mechanism state switch.
NG
Mechanism state switch faulty.
YES
OK
IC901 faulty.
Mechanism faulty.


If " 1 6 " Appears in the Display
Is 5V present at IC901-41 during power ON ?
YES
IC901 faulty.
NO
Is 5V output at IC905-1 ?
YES
Pattern between IC905-1 and IC901-41 faulty.
NO
Is 9V input to IC905-3 ?
YES
IC905 faulty.
NO
Check the peripheral circuits of QF871 and Q853 in the regulator block.

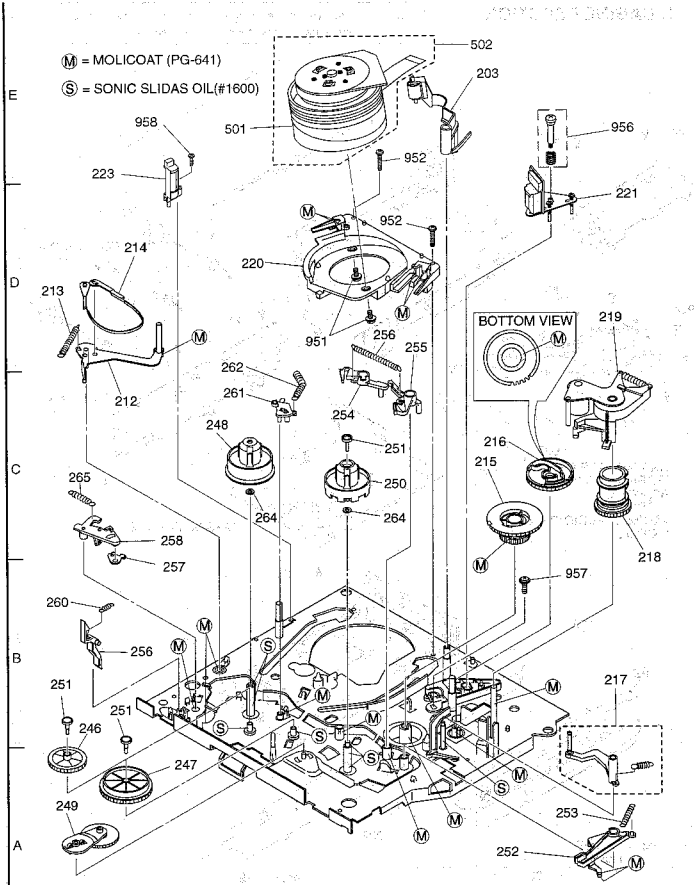


1. CABINET SECTION

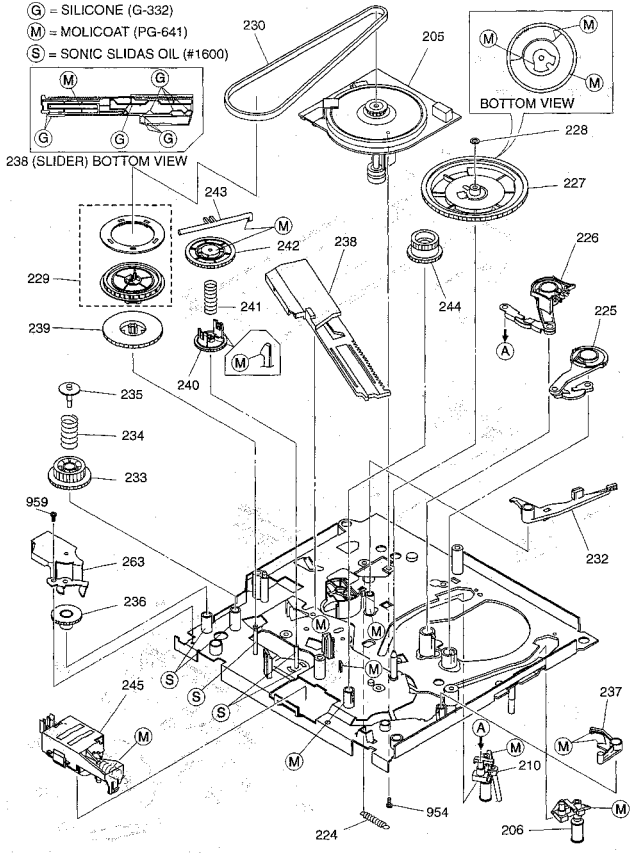
NOTE: The synthetic resin members that can be dismantled are shown by abbreviations using letters.



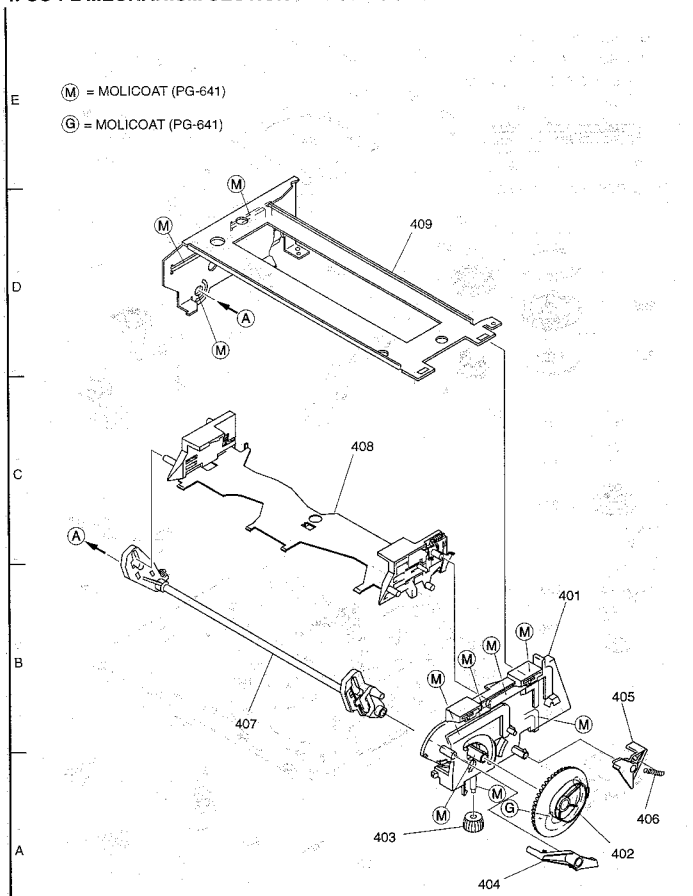
2. US-MECHANISM (TOP VIEW) SECTION



3. US-MECHANISM (BOTTOM VIEW) SECTION



4. US-FL MECHANISM SECTION



1. MECHANICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
		MECHANISM SECTION
101	QA11517	COVER, TOP (HEPM)
102	PH18221	PANEL, FRONT(HEPM) [(GK)NA, (HKN)]
102	PH18223	PANEL, FRONT(HEPM) [JU]
102	PH18224	PANEL, FRONT (HEPM) [AU]
103	PC14933	RING, SHUTTLE(HEPM)
104	PC14943	DIAL, JOG (HEPM)
106	MT10733	PIECE, FRONT (HEPM)
⚠111	EV10201	AC CORD (HEPM) [HKN]
⚠111	EV10211	AC CORD (HEPM) [(GK)NA]
⚠111	EV10221	AC CORD (HEPM) [(JU), (AU)]
117	QA11521	COVER, BOTTOM (HEPM)
118	MD11281	COVER, CBA
119	PH14343	PANEL, REAR
125	6810651	HOLDER, CBA
139	4626834	SPRING, EARTH
203	KX11661	HEAD CLEANING MECHA
205	GP10254	MOTOR, CAPSTAN
206	KX12294	BASE, GUIDE ROLLER (I)
210	KX12302	BASE, GUIDE ROLLER(O)
212	KX11531	ARM, TENSION
213	KL10662	SPRING
214	KX11631	BAND, TENSION
215	KF10641	GEAR, DRIVE
216	KF12281	GEAR, IDLER
217	KX12662	ARM, OUT
218	KX11581	GEAR, SPIRAL
219	KX11554	ARM, PINCH ROLLER
220	KX11451	BASE, CYLINDER
221	KX11944	AC HEAD
223	5423082	PE HEAD
224	KL10711	SPRING
225	KX17881	GEAR, LOADING(L)
226	KX17891	GEAR, LOADING(R)
227	KF10573	GEAR, CAM
228	4344643	WASHER
229	KX11444	PULLEY
230	KX18201	BELT
232	KX12031	BRAKE
233	KF10571	GEAR, CHANGE
234	KL10771	SPRING
235	KX12001	STOPPER, SPRING
236	KF10561	GEAR, IDLER
237	KX11831	ARM, OPERATION
238	KX11362	SLIDER
239	KF10551	GEAR, TRANS
240	KF10501	GEAR, DRIVE
241	KL10773	SPRING
242	KF10513	GEAR, CHANGE
243	KX11411	ARM, CHANGE
244	KX11371	GEAR
245	KX11892	MOTOR, LOADING
246	KF10521	GEAR, IDLER 1
247	KF10532	GEAR, IDLER 2
248	KH10152	REEL, TABLE(S)
249	KX11423	ARM
250	KH10161	REEL, TABLE(T)
251	KX11991	STOPPER
252	KX11861	BRAKE
253	KL10782	SPRING, BRAKE
254	KX11876	BRAKE, L
255	KX11883	BRAKE, R
256	KL10792	SPRING, BRAKE
257	KF10542	GEAR, JOG
258	KX13132	ARM, JOG
259	KX11641	ARM, REC
260	6542485	SPRING
261	KX11811	BRAKE, SUB
262	KL10903	SPRING, SUB
263	KX12451	BRACKET, BASE
264	MN11571	WASHER
265	KL11062	SPRING, JOG
401	KX11773	BRACKET (R)
402	KF10682	GEAR 1
403	KF10691	GEAR 2
404	KX11752	ARM, DOOR
405	KX11761	ARM, SWITCH
406	6323723	SPRING
407	KX11931	ARM, DRIVE
408	KX11922	HOLDER, CASSETTE
409	KX11741	BRACKET(L)
501	HX10292	CYLINDER ASSY (CY-U6S1)
901	8699412	SCREW(3X12) BLACK
902	MK10271	SCREW(3X12DT)
903	8671306	SCREW(2.6X6)
904	7781132	BT SCREW
905	7784323	SCREW(3X8)
906	8699410	SCREW(3X10)
951	8652408	SCREW (PSW3X8)
952	0671310	DT SCREW-2.6MMDX10MM
953	8671306	SCREW(2.6X6)
954	8691306	BT SCREW 2.6MM
956	KX12443	SCREW
957	MJ10341	SCREW(M2.6)
958	0671308	DT SCREW-2.6MMDX8MM
959	0671305	DT SCREW-2.6MMDX5MM
		ACCESSARIES
802	HL11063	REMOTE HAND SET(VT-RM8000EMG)(HEPM) [(GK)NA, (HKN), (AU)]
802	HL11064	REMOTE HAND SET(VT-RM8000EM)(HEPM)[JU]
803	5858315	AERIAL CABLE
804	EW10931	AUDIO/VIDEO CABLE
805	5856361	PAL-NTSC AERIAL CABLE[JU]
806	5699421	POWER SOCKET ADAPTER [(GK)NA, (JU)]

Note 1. Where different value components used for different models have the same symbol no., the model names are shown be abbreviation. However , the model names are not shown for components with a single symbol no. For these components, refer to the difference tables in the schematic and circuit board diagrams.

2. ELECTRICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
		CAPACITORS
C0201	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0202	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0203	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C0206	0800178	ELECTROLYTIC 4.7UF 35V
C0207	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0208	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0209	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0211	0800138	ELECTROLYTIC 47UF 6.3V
C0213	0254458	ELECTROLYTIC 3.3UF+-20% 50V
C0214	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0215	0800138	ELECTROLYTIC 47UF 6.3V
C0216	0209948	CERAMIC CHIP 330PF+-5% 50V
C0218	0800179	ELECTROLYTIC 10UF 16V
C0219	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0220	0890043	CERAMIC DISC 0.01UF+-20% 16V
C0221	0800112	ELECTROLYTIC 2.2UF 50V
C0222	0893039	CERAMIC CHIP 4700PF+-10% 50V
C0223	0800118	ELECTROLYTIC 4.7UF 35V
C0224	0800122	ELECTROLYTIC 10UF 16V
C0226	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0227	0800107	ELECTROLYTIC 0.47UF 50V
C0228	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0230	0893002	CERAMIC CHIP 0.033UF+-10% 16V
C0233	0800179	ELECTROLYTIC 10UF 16V
C0234	0800185	ELECTROLYTIC 47UF 6.3V
C0235	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0236	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0237	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0238	0800176	ELECTROLYTIC 2.2UF 50V
C0241	0207444	ELECTROLYTIC 1.0UF 50V
C0242	0800179	ELECTROLYTIC 10UF 16V
C0243	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0244	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0245	0800115	ELECTROLYTIC 3.3UF 50V
C0246	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0247	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0249	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0250	0209937	CERAMIC CHIP 39PF+-5% 50V
C0251	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0255	0209943	CERAMIC DISC 120PF+-5% 50V
C0256	0209930	CERAMIC CHIP 10PF+-0.5% 50V
C0257	0209924	CERAMIC CHIP 4PF+-0.5% 50V
C0259	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0262	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0263	0209935	CERAMIC CHIP 27PF+-5% 50V
C0270	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0273	0209934	CERAMIC CHIP 22PF+-5% 50V
C0278	0209935	CERAMIC CHIP 33PF+-5% 50V
C0291	0893031	CERAMIC CHIP 1000PF+-10% 50V
C0292	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0293	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0296	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0297	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0298	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0402	0800117	ELECTROLYTIC 4.7UF 25V
C0403	0800185	ELECTROLYTIC 47UF 6.3V
C0404	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0405	0800117	ELECTROLYTIC 4.7UF 25V
C0406	0893035	CERAMIC CHIP 2200PF+-10% 50V
C0407	0800122	ELECTROLYTIC 10UF 16V
C0408	0800122	ELECTROLYTIC 10UF 16V
C0409	0893031	CERAMIC CHIP 1000PF+-10% 50V
C0410	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0411	0800175	ELECTROLYTIC 1.0UF 50V
C0413	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0414	0800127	ELECTROLYTIC 220UF 10V
C0419	0800117	ELECTROLYTIC 4.7UF 25V
C0420	AN10332R	CAPACITOR 0.027UF+-5% 100V
C0421	0209946	CERAMIC CHIP 220PF+-5% 50V
C0422	0800145	ELECTROLYTIC 100UF 16V
C0424	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0427	0893037	CERAMIC CHIP 3300PF+-10% 50V
C0429	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0437	0800011	ELECTROLYTIC 4.7UF 35V
C0501	0800127	ELECTROLYTIC 220UF 10V
C0502	0800118	ELECTROLYTIC 4.7UF 35V
C0503	0800118	ELECTROLYTIC 4.7UF 35V
C0504	0800118	ELECTROLYTIC 4.7UF 35V
C0506	0800135	ELECTROLYTIC 33UF 16V
C0507	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0508	0800112	ELECTROLYTIC 2.2UF 50V
C0509	0800143	ELECTROLYTIC 100UF 6.3V
C0510	0893046	CERAMIC CHIP 0.015UF+-10% 50V
C0511	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0512	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0513	0800139	ELECTROLYTIC 47UF 10V
C0514	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0517	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0518	0893046	CERAMIC CHIP 0.015UF+-10% 50V
C0519	0800143	ELECTROLYTIC 100UF 6.3V
C0520	0800112	ELECTROLYTIC 2.2UF 50V
C0521	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0522	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0524	0800118	ELECTROLYTIC 4.7UF 35V
C0525	0800178	ELECTROLYTIC 4.7UF 35V
C0526	0800118	ELECTROLYTIC 4.7UF 35V
C0527	0800118	ELECTROLYTIC 4.7UF 35V
C0528	AN00629R	CAPACITOR 0.027UF+-10% 50V
C0529	0800122	ELECTROLYTIC 10UF 16V
C0530	0800122	ELECTROLYTIC 10UF 16V
C0531	0800122	ELECTROLYTIC 10UF 16V
C0532	0800141	ELECTROLYTIC 47UF 16V
C0533	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0534	0800135	ELECTROLYTIC 33UF 16V
C0535	0893046	CERAMIC CHIP 0.015UF+-10% 50V
C0536	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0601	0207441	ELECTROLYTIC 2.2UF 35V
C0604	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0606	0893031	CERAMIC CHIP 1000PF+-10% 50V
C0607	0209938	CERAMIC CHIP 47PF+-5% 50V
C0608	0209942	CERAMIC CHIP 100PF+-5% 50V
C0609	0800179	ELECTROLYTIC 10UF 16V
C0611	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0612	0800182	ELECTROLYTIC 22UF 16V
C0614	0893031	CERAMIC CHIP 1000PF+-10% 50V
C0615	0800042	ELECTROLYTIC 47UF 25V
C0621	0890036	CERAMIC DISC 3300PF+-20% 16V
C0623	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0624	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0701	0893053	CERAMIC CHIP 0.047UF+-10% 50V
⚠C0851	AN10201S	FILM CAPACITOR 0.1UF+-20% 250V
⚠C0852	AN10201S	FILM CAPACITOR 0.1UF+-20% 250V
C0857	AJ10294	CERAMIC CAPACITOR 4700PF+-20% 125V
C0858	AJ10294	CERAMIC CAPACITOR 4700PF+-20% 125V
C0859	0800206	ELECTROLYTIC 47UF 35V
C0860	AN10401R	CAPACITOR 0.047UF+-10% 250V
C0862	AL10191	ELECTROLYTIC 82UF 400V (HEPM)

SYMBOL NO	P-NO	DESCRIPTION
C0863	AJ10245R	CERAMIC CHIP 2200PF+-10% 50V
C0865	1143005	CERAMIC CAPACITOR 220PF+-5% 1KV
C0866	0209950	CERAMIC CHIP 470PF+-5% 50V
C0871	0254403	CAPACITOR 22UF+-20% 50V
C0872	0254405	CAPACITOR 1000UF+-20% 25V
C0873	0800354	ELECTROLYTIC 470UF 25V
C0874	AL10481S	ELECTROLYTIC 3300UF 16V
C0875	0800352	ELECTROLYTIC 470UF 10V
C0876	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0877	1143001	CERAMIC CAPACITOR 56PF+-5% 1KV
C0881	0800135	ELECTROLYTIC 33UF 16V
C0884	0800015	ELECTROLYTIC 10UF 16V
C0887	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C0896	0800122	ELECTROLYTIC 10UF 16V
C0902	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0903	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0904	0217516	CAPACITOR 0.047UF+80-20% 5.5V
C0905	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0906	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0907	0209927	CERAMIC CHIP 7.0PF+-0.5% 50V
C0908	0209927	CERAMIC CHIP 7.0PF+-0.5% 50V
C0909	0209932	CERAMIC CHIP 15PF+-5% 50V
C0910	0209932	CERAMIC CHIP 15PF+-5% 50V
C0912	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0913	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0914	0800033	ELECTROLYTIC 33UF 25V
C0915	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0916	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0919	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0922	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0923	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0924	0209938	CERAMIC CHIP 47PF+-5% 50V
C0925	0209938	CERAMIC CHIP 47PF+-5% 50V
C0926	0209930	CERAMIC CHIP 10PF+-0.5% 50V
C0927	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0940	0209938	CERAMIC CHIP 47PF+-5% 50V
C0941	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0945	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0946	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0950	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0951	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C0982	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1103	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1104	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1105	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1106	0800185	ELECTROLYTIC 47UF 6.3V
C1107	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1108	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1111	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1112	0800177	ELECTROLYTIC 3.3UF 50V
C1114	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1115	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1116	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1117	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1119	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1120	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1121	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1122	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1124	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1125	0800185	ELECTROLYTIC 47UF 6.3V
C1126	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1138	0209942	CERAMIC CHIP 100PF+-5% 50V
C1140	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1141	0209950	CERAMIC CHIP 470PF+-5% 50V
C1412	0800185	ELECTROLYTIC 47UF 6.3V

SYMBOL NO	P-NO	DESCRIPTION
C1419	0209931	CERAMIC CHIP 12PF+-5% 50V
C1420	0800141	ELECTROLYTIC 47UF 16V
C1421	0209937	CERAMIC CHIP 39PF+-5% 50V
C1422	0209938	CERAMIC CHIP 47PF+-5% 50V
C1423	0800141	ELECTROLYTIC 47UF 16V
C1424	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C1425	0209931	CERAMIC CHIP 12PF+-5% 50V
C2101	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2102	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2501	0893037	CERAMIC CHIP 3300PF+-10% 50V
C2502	0893037	CERAMIC CHIP 3300PF+-10% 50V
C2503	0800351	ELECTROLYTIC 470UF 6.3V
C2504	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C2507	0800011	ELECTROLYTIC 4.7UF 35V
C2508	0893037	CERAMIC CHIP 3300PF+-10% 50V
C2509	0800041	ELECTROLYTIC 47UF 16V
C2513	0800352	ELECTROLYTIC 470UF 10V
C2514	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2515	0800139	ELECTROLYTIC 470UF 10V
C2517	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2518	0800044	ELECTROLYTIC 47UF 50V
C2519	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2520	0800353	ELECTROLYTIC 470UF 16V
C2521	0800041	ELECTROLYTIC 47UF 16V
C2522	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2523	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C2524	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2525	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C2532	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2533	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2534	0207458	ELECTROLYTIC 10UF 25V
C2540	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C2541	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2542	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2543	0800122	ELECTROLYTIC 10UF 16V
C2544	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C2545	0600179	ELECTROLYTIC 10UF 16V
C2546	0207446	CERAMIC CHIP 10UF+-20% 16V
C2548	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C2549	0893091	CERAMIC CHIP 0.022UF+-10% 16V

RESISTORS

R0212	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0213	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0215	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0216	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0217	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R0229	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0230	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0236	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0238	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0239	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R0241	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R0253	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0256	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0258	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0261	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0263	0103881	CHIP RESISTOR 2.2MOHM+-10% 0.1W
R0264	0105515	CHIP RESISTOR 4.7MOHM+-5% 1/10W
R0269	0103834	CHIP RESISTOR 180 OHM+-5% 0.1W
R0284	0700081	CARBON FILM 1MOHM+-5% 1/8W
R0402	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R0407	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0408	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R0409	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R0410	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0413	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R0414	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0418	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0419	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R0420	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0421	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0422	0103812	CHIP RESISTOR 2.7OHM+-10% 0.1W
R0423	0700056	CARBON FILM 15KOHM+-5% 1/8W
R0424	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0425	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0429	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0430	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0431	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0432	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0434	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R0450	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R0501	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R0502	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0502	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R0502	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R0503	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R0504	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R0505	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R0506	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R0509	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0510	0104252	CHIP RESISTOR 510 OHM+-5% 1/10W
R0511	AQ1029GR	CHIP RESISTOR 15KOHM+-0.1% 1/10W
R0512	AQ1029GR	CHIP RESISTOR 11KOHM+-0.1% 1/10W
R0516	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0517	0104252	CHIP RESISTOR 510 OHM+-5% 1/10W
R0520	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0521	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R0522	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0523	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R0524	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0525	0700056	CARBON FILM 15KOHM+-5% 1/8W (JU)
R0525	0700053	CARBON FILM 8.2KOHM+-5% 1/8W (AU)
R0525	0700057	CARBON FILM 18KOHM+-5% 1/8W(GK1)NA, (HKN)
R0526	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0527	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0528	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0529	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0529	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0530	0700047	CARBON FILM 3.3KOHM+-5% 1/8W
R0531	0103843	CHIP RESISTOR 1.0KOHM+-5% 0.1W
R0532	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R0533	0103866	CHIP RESISTOR 82KOHM+-5% 0.1W
R0534	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R0602	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0603	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0605	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0615	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0616	0700072	CARBON FILM 220KOHM+-5% 1/8W
R0621	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0622	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0623	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0624	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0625	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R0629	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R0630	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R0631	0103870	CHIP RESISTOR 180KOHM+-5% 0.1W
R0632	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0633	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R0634	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0635	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0636	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R0637	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R0703	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0852	AT10211W	CHIP RESISTOR 1MOHM 1/2W
R0854	0116671	RESISTOR 100KOHM+-5% 3w
R0855	0116671	RESISTOR 100KOHM+-5% 3w
R0856	AT10261S	RESISTOR 220KOHM+-5% 2W
R0859	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0860	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R0861	0700038	CARBON FILM 680 OHM+-5% 1/8W
R0862	AT10246S	RESISTOR 0.33 OHM+-5% 1W
R0863	0700021	CARBON FILM 33 OHM+-5% 1/8W
R0866	0700038	CARBON FILM 680 OHM+-5% 1/8W
R0867	0700032	CARBON FILM 220 OHM+-5% 1/8W
R0868	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0869	0104114	CHIP RESISTOR 3.3KOHM+-1% 0.1W
R0870	0105572	METAL FILM RESISTOR 2.7KOHM+-1% 1/10W
R0871	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0872	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0873	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0874	0700058	CARBON FILM 22KOHM+-5% 1/8W
R0875	0700035	CARBON FILM 390 OHM+-5% 1/8W
R0880	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0881	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R0885	0700056	CARBON FILM 15KOHM+-5% 1/8W
R0886	0700056	CARBON FILM 15KOHM+-5% 1/8W
R0887	0700045	CARBON FILM 2.7KOHM+-5% 1/8W
R0888	AT10245S	RESISTOR 68 OHM+-5% 2W
R0889	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0892	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R0894	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0895	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0896	0700058	CARBON FILM 22KOHM+-5% 1/8W
R0897	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0904	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0906	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0907	0700043	CARBON FILM 1.5KOHM+-5% 1/8W(AU)
R0907	0700051	CARBON FILM 5.6KOHM+-5% 1/8W(JU)
R0907	0700057	CARBON FILM 18KOHM+-5% 1/8W (GK1)NA
R0907	0700065	CARBON FILM 68KOHM+-5% 1/8W (HKN)
R0908	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0909	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R0910	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0911	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R0913	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0914	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0915	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0916	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0917	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0918	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0919	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0920	0700054	CARBON FILM 10KOHM+-5% 1/8W
R0921	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0922	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0923	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R0924	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0925	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0926	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0928	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0929	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0934	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0935	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0936	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R0937	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R0938	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0939	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0940	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0943	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0944	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0945	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0946	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0947	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0948	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0949	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0957	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R0960	0700053	CARBON FILM 47KOHM+-5% 1/8W
R0964	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0965	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R0967	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R0968	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0976	0101725	CHIP RESISTOR 2.2 OHM+-5% 1/4W
R0977	0700067	CARBON FILM 100KOHM+-5% 1/8W
R0978	0101765	RESISTOR 10KOHM+-1% 1/8W
R0983	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0984	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0985	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0989	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0991	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0993	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R0995	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R0996	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R0997	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0998	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0999	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1103	0103820	CHIP RESISTOR 12 OHM+-5% 0.1W
R1104	0103831	CHIP RESISTOR 120 OHM+-5% 0.1W
R1120	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R1121	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1414	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1421	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R1423	0700035	CARBON FILM 390 OHM+-5% 1/8W
R1425	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R1427	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1428	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R1429	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2101	0700059	CARBON FILM 27KOHM+-5% 1/8W
R2102	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R2103	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2104	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R2105	0103867	CHIP RESISTOR 47KOHM+-5% 0.1W
R2106	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R2107	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2108	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R2109	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2110	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R2111	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2112	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2113	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R2114	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R2115	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2116	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2117	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R2501	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R2502	0700041	CARBON FILM 1KOHM+-5% 1/8W
R2503	0101400	CARBON FILM 75 OHM+-5% 1/4W
R2504	0103833	CHIP RESISTOR 150 OHM+-5% 0.1W
R2507	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R2508	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R2509	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R2510	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2511	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R2512	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2513	0103833	CHIP RESISTOR 150 OHM+-5% 0.1W
R2514	0101836	CARBON FILM 1.8KOHM+-5% 1/4W
R2518	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R2529	0103833	CHIP RESISTOR 150 OHM+-5% 0.1W
R2530	0103833	CHIP RESISTOR 150 OHM+-5% 0.1W
R2531	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2532	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2534	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R2535	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R2542	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
K0436	0700041	CARBON FILM 1KOHM+-5% 1/8W

SEMI-CONDUCTORS

D0206	5339071	DIODE 1SS119
D0207	5339071	DIODE 1SS119
D0401	5339071	DIODE 1SS119
⚠D0851	5336552	DIODE S1WBA60
D0852	CH10191M	DIODE EG01C-T
D0853	CH10481M	DIODE AG01Z
D0854	CH10481M	DIODE AG01Z
D0855	CH10481M	DIODE AG01Z
D0671	5339592	DIODE D1NL40
D0672	CH10462S	DIODE S3L20U
D0673	CH10541S	DIODE DS28M
D0676	5339551	DIODE SS1J4
D0677	5339551	DIODE SS1J4
D0678	5339071	DIODE 1SS119
D0896	CH10871M	DIODE 1N4001
D0897	CH10871M	DIODE 1N4001
D0898	CH10871M	DIODE 1N4001
D0901	5339551	DIODE SS1J4
D0906	5339071	DIODE 1SS119
D0907	5339071	DIODE 1SS119
D0912	CH10871M	DIODE 1N4001
D0913	CH10871M	DIODE 1N4001
D1103	5339071	DIODE 1SS119
D1403	5339071	DIODE 1SS119
D2501	5339071	DIODE 1SS119
D2502	5339071	DIODE 1SS119
D2503	5339071	DIODE 1SS119
D2505	5339071	DIODE 1SS119
LD2101	CH10542	DIODE GL451L1
IC0201	CK22053	IC JCP9018MSB (HEPM)
IC0501	CK14421	IC AN3964FB
IC0851	CP12461F	IC STR-F6653 (HEPM)
IC0871	CP11961R	IC HA17431PA
IC0901	CK21209	IC HD6433977SC20F (HEPM)
IC0902	CP10312R	IC PST9129
IC0903	CP10915	IC ST24C02FB6
IC0904	CP10291	IC BA6209
IC0905	CP11361R	IC M5278L05
IC1102	CK20671R	IC AN3229S-E1
IC2101	CJ10391	SENSOR SG-HT10(T)
IC2102	CJ10401	SENSOR SG-HT11(S)
IC2501	CP12231	IC NJM2534D (HEPM)
⚠PC0851	CF10431G	PHOTO COUPLER PC123FY
⚠PC0852	CF10431G	PHOTO COUPLER PC123FY
Q0202	5326903	TRANSISTOR UN2213
Q0219	5326903	TRANSISTOR UN2213
Q0222	5326903	TRANSISTOR UN2213

SYMBOL NO	P-NO	DESCRIPTION
Q0227	5326903	TRANSISTOR UN2213
Q0229	5326903	TRANSISTOR UN2213
Q0232	5326903	TRANSISTOR UN2213
Q0234	5326904	TRANSISTOR UN2113
Q0403	CA10672R	TRANSISTOR 2SD601A
Q0405	CA10582R	TRANSISTOR 2SB709A
Q0406	5323172	TRANSISTOR 2SC1214CD
Q0411	CA10582R	TRANSISTOR 2SB709A
Q0412	CA10672R	TRANSISTOR 2SD601A
Q0413	CA10672R	TRANSISTOR 2SD601A
Q0601	5326903	TRANSISTOR UN2213
Q0853	1321341	TRANSISTOR 2SD1765
Q0871	5326903	TRANSISTOR UN2213
Q0874	5327262	TRANSISTOR 2SB1326
Q0875	CA10672R	TRANSISTOR 2SD601A
Q0876	5327262	TRANSISTOR 2SB1326
Q0877	CA10672R	TRANSISTOR 2SD601A
Q0880	1321341	TRANSISTOR 2SD1765
Q0896	CF10451R	TRANSISTOR 2SC3246
Q0901	5327261	TRANSISTOR 2SB1326(Q)
Q0902	5326903	TRANSISTOR UN2213
Q0909	5326903	TRANSISTOR UN2213
Q0913	5326903	TRANSISTOR UN2213
Q0914	5326903	TRANSISTOR UN2213
Q1104	5326903	TRANSISTOR UN2213
Q1407	CA10582R	TRANSISTOR 2SB709A
Q1408	CA10582R	TRANSISTOR 2SB709A
Q2101	CF10372	TRANSISTOR PT493FL1
Q2102	CF10372	TRANSISTOR PT493FL1
Q2103	5326903	TRANSISTOR UN2213
Q2104	5326903	TRANSISTOR UN2213
Q2501	CA10672R	TRANSISTOR 2SD601A
Q2502	CA10672R	TRANSISTOR 2SD601A
Q2503	CA10672R	TRANSISTOR 2SD601A
Q2505	5326903	TRANSISTOR UN2213
Q2506	5327021	TRANSISTOR 2SA844CD
Q2508	CA10672R	TRANSISTOR 2SD601A
Q2511	5326904	TRANSISTOR UN2113
Q2512	5326903	TRANSISTOR UN2213
⚠QF0871	5721946	PROTECTOR, ICP-N15
⚠QF0872	5721944	IC PROTECTOR, ICP-N25
⚠QF0873	5721943	IC PROTECTOR
ZD0871	5339468	DIODE HZS11B3
ZD0872	5339482	DIODE HZS15-2
ZD0886	5339464	DIODE HZS12A3
ZD0901	5339275	DIODE HZS7-B2
ZD0903	5339287	DIODE HZS5C3
ZD2501	5339288	DIODE HZS30-3
		TRANSFORMERS
T0401	BT10251	TRANSFORMER, POWER
⚠T0851	BT10481	TRANSFORMER, POWER
		COILS
L0201	5159142	CHOKE COIL 12UH
L0202	0770057	CHOKE COIL 100UH+-5%
L0205	0770057	CHOKE COIL 100UH+-5%
L0207	5159153	CHOKE COIL 82UH
L0208	0770057	CHOKE COIL 100UH+-5%
L0210	5159146	CHOKE COIL 27UH
L0401	0770057	CHOKE COIL 100UH+-5%
L0403	0770057	CHOKE COIL 100UH+-5%
L0501	0770048	CHOKE COIL 22UH+-5%

SYMBOL NO	P-NO	DESCRIPTION
⚠L0851	BJ10251	FILTER, LC
⚠L0852	BJ10251	FILTER, LC
L0871	BH00201R	COIL 10UH
L0872	BH00205R	COIL 22UH
L0901	0770057	CHOKE COIL 100UH+-5%
L1101	5121611	COIL
L1102	0770057	CHOKE COIL 100UH+-5%
L1105	5121296	COIL 220UH
L1405	5121287	COIL 10UH
L2501	0770053	CHOKE COIL 47UH-5%
L2502	0770057	CHOKE COIL 100UH+-5%
L2504	0770052	COIL, CHOKE 39UH+-5%
L2505	0770057	CHOKE COIL 100UH+-5%
L2507	0770053	CHOKE COIL 47UH+-5%
		CRYSTALS
X0201	BP10532	CRYSTAL (HEPM)
X0202	BP10541	CRYSTAL (HEPM)
X0901	BP10571	CRYSTAL
X0902	BP10251	CRYSTAL
		MISCELLANEOUS
BL0601	BZ10471R	CORE
BL0602	BZ10471R	CORE
BL0603	BZ10471R	CORE
BL0604	5272376	FILTER
BL0851	BZ10471R	CORE
BL0852	BZ10471R	CORE
BL0853	BZ10471R	CORE
BL0871	BZ10471R	CORE
BL0872	BZ10471R	CORE
BL0873	BZ10471R	CORE
BL0874	5274522	CORE
BL2501	BZ10471R	CORE
BL2502	BZ10471R	CORE
⚠F0851	5721061	FUSE 1.6A
FE2501	HC10361	TUNER IF UNIT (HEPM) (GK)NA, (HKN), (JU)
FE2501	HC10352	TUNER IF UNIT (HEPM) (AU)
⚠FH0851	5722413	HOLDER, FUSE (HEPM)
⚠FH0852	5722413	HOLDER, FUSE (HEPM)
JK2501	ES10343	JACK
S2101	FD10211	SWITCH, MODE
S2102	5635631	SWITCH
S2103	5635631	SWITCH
		N&A BOARD (FOR (GK)NA, (HKN))
		CAPACITORS
C1801	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1803	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1805	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1807	0880019	POLYESTER FILM 0.33UF+-10% 50V
C1808	0893083	CHIP CERAMIC 0.033UF 50V
C1809	0209932	CERAMIC CHIP 15PF+-5% 50V
C1810	0209933	CERAMIC CHIP 18PF+-5% 50V
C1812	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1814	0893027	CERAMIC CHIP 0.1UF+-10% 25V
C1815	0209896	CERAMIC CHIP 47PF+-5% 50V
C1816	0800279	CAPACITOR 1.0UF+-20% 50V
C1817	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1819	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1821	0800291	ELECTROLYTIC 10UF 16V

SYMBOL NO	P-NO	DESCRIPTION
C1822	0800316	ELECTROLYTIC 47UF 10V
C1824	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1825	0800316	ELECTROLYTIC 47UF 10V
C1826	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C1827	0800316	ELECTROLYTIC 47UF 10V
C1828	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C1851L	0800291	ELECTROLYTIC 10UF 16V
C1851R	0800291	ELECTROLYTIC 10UF 16V
C1852L	0209653	CERAMIC DISC 68PF+-5% 50V
C1852R	0209653	CERAMIC DISC 68PF+-5% 50V
C1853L	0800291	ELECTROLYTIC 10UF 16V
C1853R	0800291	ELECTROLYTIC 10UF 16V
C1854L	0800291	ELECTROLYTIC 10UF 16V
C1854R	0800291	ELECTROLYTIC 10UF 16V
C1855L	0893037	CERAMIC CHIP 3300PF+-10% 50V
C1855R	0893037	CERAMIC CHIP 3300PF+-10% 50V
C1861	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C1862	0893008	CERAMIC CHIP 0.1UF +-10% 16V
		RESISTORS
R1802	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1803	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1804	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1805	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1806	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R1807	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R1813	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1816	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1817	0700053	CARBON FILM 8.2KOHM+-5% 1/8W
R1851L	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1851R	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1852L	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1852R	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1853L	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1853R	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1854L	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R1854R	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R1855L	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1855R	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1856L	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1856R	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1857L	0103832	CHIP RESISTOR 120 OHM+-5% 0.1W
R1857R	0103832	CHIP RESISTOR 120 OHM+-5% 0.1W
		SEMI-CONDUCTORS
D1801	CC11071R	DIODE HVU202A
IC1801	CX22116T	IC TDA9874H (HEPM)
IC1802	5352714	IC NJM4558M
		COILS
L1802	0770048	CHOKE COIL 22UH+-5%
L1803	0770057	CHOKE COIL 100UH+-5%
L1805	5121284	COIL 3.3UH
L1851L	5159113	COIL,CHOKE 8.2MH
L1851R	5159113	COIL,CHOKE 8.2MH
		CRYSTAL
X1801	BP10821	CRYSTAL
		MISCELLANEOUS

SYMBOL NO	P-NO	DESCRIPTION
BL1801	RM00154R	COIL
BL1802	RM00154R	COIL
		A2 BOARD (FOR (AU))
		CAPACITORS
C1857	0800185	ELECTROLYTIC 47UF 6.3V
C1858	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1860	0800176	ELECTROLYTIC 2.2UF 50V
C1861	0800176	ELECTROLYTIC 2.2UF 50V
C1862	0800178	ELECTROLYTIC 4.7UF 35V
C1863	0800178	ELECTROLYTIC 4.7UF 35V
C1864	0800015	ELECTROLYTIC 10UF 16V
C1865	0800179	ELECTROLYTIC 10UF 16V
C1871	0800176	ELECTROLYTIC 2.2UF 50V
C1872	0800176	ELECTROLYTIC 2.2UF 50V
C1873	AJ10176R	CERAMIC CAPACITOR 5.0PF+-0.25% 50V
C1874	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1875	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1879	0800176	ELECTROLYTIC 2.2UF 50V
C1881	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1882	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1890	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1891	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1895	0890025	CERAMIC DISC 180PF+-10% 50V
C1896	0800187	ELECTROLYTIC 100UF 6.3V
C1897	0890036	CERAMIC DISC 1500PF+-20% 16V
C1898	0800179	ELECTROLYTIC 10UF 16V
C1899	0890046	CERAMIC DISC 0.1UF+80-20% 50V
		RESISTORS
R1864	0700034	CARBON FILM 330 OHM+-5% 1/8W
R1865	0700034	CARBON FILM 330 OHM+-5% 1/8W
R1870	0700038	CARBON FILM 680 OHM+-5% 1/8W
R1871	0700037	CARBON FILM 560 OHM+-5% 1/8W
R1872	0700031	CARBON FILM 180 OHM+-5% 1/8W
R1873	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1874	0700037	CARBON FILM 560 OHM+-5% 1/8W
R1875	0700028	CARBON FILM 120 OHM+-5% 1/8W
R1876	0700028	CARBON FILM 120 OHM+-5% 1/8W
R1877	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1878	0700059	CARBON FILM 27KOHM+-5% 1/8W
R1899	0700059	CARBON FILM 27KOHM+-5% 1/8W
		SEMI-CONDUCTORS
IC1871	CX14551	IC TDA9840T
IC1872	1346191	IC TDA9821
		COILS
L1871	0770057	CHOKE COIL 100UH+-5%
L1872	5159111	CHOKE COIL 5600UH
		CRYSTAL
X1871	BP10571	CRYSTAL
		MISCELLANEOUS
CF1871	5160561	FILTER
CF1872	5160562	FILTER

SYMBOL NO	P-NO	DESCRIPTION
		J&U BOARD [(FOR (JU))]
		CAPACITORS
C1801	0800041	ELECTROLYTIC 47UF 16V
C1802	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1803	0800103	ELECTROLYTIC 0.22UF 50V
C1804	0800015	ELECTROLYTIC 10UF 16V
C1805	0800015	ELECTROLYTIC 10UF 16V
C1806	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1807	0800015	ELECTROLYTIC 10UF 16V
C1808	0800015	ELECTROLYTIC 10UF 16V
C1809	0800015	ELECTROLYTIC 10UF 16V
C1810	0800015	ELECTROLYTIC 10UF 16V
C1811	0800015	ELECTROLYTIC 10UF 16V
C1812	0800015	ELECTROLYTIC 10UF 16V
C1813	0893044	CERAMIC CHIP 0.01UF+-10% 50V
		RESISTORS
R1801	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1802	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1803	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1804	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1806	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1807	0103843	CHIP RESISTOR 1.0KOHM+-5% 0.1W
R1808	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1809	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R1810	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1811	0700064	CARBON FILM 56KOHM+-5% 1/8W
R1812	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1814	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1815	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1816	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1817	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1818	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1819	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1820	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1821	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1822	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1823	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
RT1801	5030088	SEMI VARIABLE 22KOHM
RT1802	5030088	SEMI VARIABLE 22KOHM
		SEMI-CONDUCTORS
D1801	5339071	DIODE 1SS119
D1802	5339071	DIODE 1SS119
D1803	5339071	DIODE 1SS119
D1804	5339071	DIODE 1SS119
D1805	5339071	DIODE 1SS119
D1806	5339071	DIODE 1SS119
IC1801	CS10571	IC HTS7342
IC1802	CP11302	IC CXA2020S
IC1803	1365812	IC BA3129
Q1801	5326903	TRANSISTOR UN2213
Q1802	5326904	TRANSISTOR UN2113
		COIL
L1801	0770057	CHOKE COIL 100UH+-5%
		LJC BOARD
		CAPACITORS

SYMBOL NO	P-NO	DESCRIPTION
C1701	0800185	ELECTROLYTIC 47UF 6.3V
C1702	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1703	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1704	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1705	0890035	CERAMIC DISC 1000PF+-10% 50V
C1706	0800185	ELECTROLYTIC 47UF 6.3V
C1707	0800112	ELECTROLYTIC 2.2UF 50V
		RESISTORS
R1701	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1702	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1703	0700038	CARBON FILM 680 OHM+-5% 1/8W
R1704	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1705	0700067	CARBON FILM 100KOHM+-5% 1/8W
R1720	0700051	CARBON FILM 5.6KOHM+-5% 1/8W
R1721	0700039	CARBON FILM 820 OHM+-5% 1/8W
R1722	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1723	0700037	CARBON FILM 560 OHM+-5% 1/8W
R1724	0700047	CARBON FILM 3.3KOHM+-5% 1/8W
R1725	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1726	0700035	CARBON FILM 390 OHM+-5% 1/8W
R1727	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1728	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1729	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1730	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1731	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1732	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1733	0700034	CARBON FILM 330 OHM+-5% 1/8W
R1735	0700033	CARBON FILM 270 OHM+-5% 1/8W
		SEMI-CONDUCTORS
D1701	5339071	DIODE 1SS119
D1702	CH11171M	DIODE AK04
IC1701	CZ10182	IC BU9716AK (HEPM)
LD1701	CH11141R	DIODE SEL6414E (HEPM)
LD1702	CH11141R	DIODE SEL6414E (HEPM)
LD1703	CH11141R	DIODE SEL6414E (HEPM)
LD1704	CH11141R	DIODE SEL6414E (HEPM)
LD1705	CH11141R	DIODE SEL6414E (HEPM)
LD1706	CH11231R	DIODE SEL5220ST18F (HEPM)
LD1708	CH10472R	DIODE SEL6410E
Q1702	5327063	TRANSISTOR 2SC1740S
Q1703	CF10851R	TRANSISTOR DTC124ESA (HEPM)
Q1704	CF10851R	TRANSISTOR DTC124ESA (HEPM)
Q1706	CF10851R	TRANSISTOR DTC124ESA (HEPM)
IR1701	CJ10341	MODULE PIC-21043TE3 (HEPM)
		COIL
L1701	0770057	CHOKE COIL 100UH+-5%
		MISCELLANEOUS
LCD1701	DB10373	DISPLAY,LIQUID CRYSTAL (HEPM)
LMP1701	DP10221	LIGHT,BACK
LMP1702	DP10221	LIGHT,BACK
LMP1703	DP10221	LIGHT,BACK
LMP1704	DP10221	LIGHT,BACK
S1710	5634884	SWITCH
S1711	5634884	SWITCH
S1712	5634884	SWITCH
S1714	5634884	SWITCH

SYMBOL NO	P-NO	DESCRIPTION
S1715	5634884	SWITCH
S1719	5634884	SWITCH
		FST BOARD
		CAPACITORS
C2701	AJ10241R	CERAMIC CAPACITOR 100PF+-10% 50V
C2702	AJ10241R	CERAMIC CAPACITOR 100PF+-10% 50V
C2703	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C2704	0890044	CERAMIC DISC 0.022UF+80-20% 25V
		RESISTORS
R2701	0700057	CARBON FILM 18KOHM+-5% 1/8W
R2702	0700054	CARBON FILM 10KOHM+-5% 1/8W
R2703	0700057	CARBON FILM 18KOHM+-5% 1/8W
R2704	0700054	CARBON FILM 10KOHM+-5% 1/8W
R2706	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R2707	0700039	CARBON FILM 820 OHM+-5% 1/8W
R2708	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R2709	0700027	CARBON FILM 100 OHM+-5% 1/8W
R2710	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R2711	0700032	CARBON FILM 220 OHM+-5% 1/8W
R2712	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R2713	0700029	CARBON FILM 150 OHM+-5% 1/8W
R2714	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R2715	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R2716	0700067	CARBON FILM 100KOHM+-5% 1/8W
R2717	0700067	CARBON FILM 100KOHM+-5% 1/8W
R2718	0700067	CARBON FILM 100KOHM+-5% 1/8W
R2719	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R2720	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R2721	0700067	CARBON FILM 100KOHM+-5% 1/8W
R2722	0700054	CARBON FILM 10KOHM+-5% 1/8W
R2723	0700063	CARBON FILM 47KOHM+-5% 1/8W
R2724	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R2725	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R2727	0700063	CARBON FILM 47KOHM+-5% 1/8W
R2728	0700063	CARBON FILM 47KOHM+-5% 1/8W
		SEMI-CONDUCTORS
IC2701	CK12311	IC UPD71036S-752
LD2701	CH11131	DIODE LF60 (HEPM)
Q2701	CF10852R	TRANSISTOR DTC144ESA
Q2702	CF10852R	TRANSISTOR DTC144ESA
		CRYSTAL
X2701	BP10451G	CRYSTAL
		MISCELLANEOUS
S2701	5634884	SWITCH
S2704	5634884	SWITCH
S2706	5634884	SWITCH
S2708	5634884	SWITCH
S2709	5634884	SWITCH
S2721	FH10231	SWITCH
		NCM BODAR
		CAPACITORS

SYMBOL NO	P-NO	DESCRIPTION
C0351	0207445	ELECTROLYTIC 4.7UF 16V
C0352	0207444	ELECTROLYTIC 1UF 50V
C0356	0209933	CERAMIC CHIP 18PF+-5% 50V
C0357	0209940	CERAMIC CHIP 68PF+-5% 50V
C0358	0209934	CERAMIC CHIP 22PF+-5% 50V
C0359	0800141	ELECTROLYTIC 47UF 16V
C0360	0209938	CERAMIC CHIP 47PF+-5% 50V
C0361	0209938	CERAMIC CHIP 47PF+-5% 50V
C0362	0209941	CERAMIC CHIP 82PF+-5% 50V
C0363	0800109	ELECTROLYTIC 1.0UF 50V
C0364	0800109	ELECTROLYTIC 1.0UF 50V
C0365	0893084	CERAMIC CHIP 0.047UF+80-20% 50V
C0366	0800109	ELECTROLYTIC 1.0UF 50V
C0368	0893084	CERAMIC CHIP 0.047UF+80-20% 50V
C0369	0209940	CERAMIC CHIP 68PF+-5% 50V
C0370	0800178	ELECTROLYTIC 4.7UF 35V
C0371	0209941	CERAMIC CHIP 82PF+-5% 50V
C0372	0209932	CERAMIC CHIP 15PF+-5% 50V
C0373	0209930	CERAMIC CHIP 10PF+-5% 50V
C0374	0209930	CERAMIC CHIP 10PF+-5% 50V
C0377	0800139	ELECTROLYTIC 47UF 10V
C0378	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C4103	0800109	ELECTROLYTIC 1.0UF 50V
C4105	0209934	CERAMIC CHIP 22PF+-5% 50V
C4106	0209935	CERAMIC CHIP 33PF+-5% 50V
C4107	0209935	CERAMIC CHIP 27PF+-5% 50V
C4110	0800122	ELECTROLYTIC 10UF 16V
C4111	0893093	CERAMIC CHIP 2.2UF+80-20% 16V
C4112	0893093	CERAMIC CHIP 2.2UF+80-20% 16V
C4113	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C4114	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C4115	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C4116	0209944	CERAMIC CHIP 150PF+-5% 50V
C4117	0209944	CERAMIC CHIP 150PF+-5% 50V
C4118	0209933	CERAMIC CHIP 18PF+-5% 50V
C4119	0893008	CERAMIC CHIP 0.1UF+-10% 50V
C4120	0209897	CERAMIC CHIP 56PF+-5% 50V
C4121	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C4123	0800135	ELECTROLYTIC 33UF 16V
C4124	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C4128	0800122	ELECTROLYTIC 10UF 16V
C4129	0800109	ELECTROLYTIC 1.0UF 50V
C4130	0893086	CERAMIC CHIP 0.1UF+80-20% 50V
C4131	0800128	ELECTROLYTIC 22UF 16V
C4132	0207445	ELECTROLYTIC 4.7UF 16V
C4216	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C4217	0800122	ELECTROLYTIC 10UF 16V
C4301	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C4302	0893062	CERAMIC CHIP 1UF+80-20% 16V
C4303	0893031	CERAMIC CHIP 1000PF+-10% 50V
C4304	0209945	CERAMIC DISC 180PF+-5% 50V
C4305	0893086	CERAMIC CHIP 0.1UF+80-20% 50V
C4307	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C4308	0202163	CERAMIC CAPACITOR 560PF+-5% 50V
C4309	0800115	ELECTROLYTIC 3.3UF 50V
C4310	0893037	CERAMIC CHIP 3300PF+-10% 50V
C4311	0893062	CERAMIC CHIP 1UF+80-20% 16V
C4312	0800122	ELECTROLYTIC 10UF 16V
C4313	0893086	CERAMIC CHIP 0.1UF+80-20% 50V
C4314	0202163	CERAMIC CAPACITOR 560PF+-5% 50V
C4315	0202163	CERAMIC CAPACITOR 560PF+-5% 50V
C4316	0893062	CERAMIC CHIP 1UF+80-20% 16V
C4317	0209942	CERAMIC CHIP 100PF+-5% 50V
C4318	0800351	ELECTROLYTIC 470UF 6.3V
C4319	0893079	CERAMIC DISC 0.01UF+80-20% 50V

SYMBOL NO	P-NO	DESCRIPTION
C4322	0800365	ELECTROLYTIC 2200UF 6V
C4323	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C4329	0893014	CERAMIC CHIP 0.01UF+-10% 25V
		RESISTORS
R0351	0700054	CARBON FILM 10KOHM+-5% 1/8W
R0352	0103881	CHIP RESISTOR 2.2MOHM+-10% 0.1W
R0353	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R0354	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0355	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R0356	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R0357	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R0358	0700021	CARBON FILM 33 OHM+-5% 1/8W
R0359	0103834	CHIP RESISTOR 180 OHM+-5% 0.1W
R0360	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0361	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R0363	0700034	CARBON FILM 330 OHM+-5% 1/8W
R0364	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R0365	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0366	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R0367	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0368	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0369	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R0370	0103843	CHIP RESISTOR 1.0KOHM+-5% 0.1W
R0371	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R4105	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R4106	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R4108	0103875	CHIP RESISTOR 470KOHM+-5% 0.1W
R4113	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R4114	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R4115	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R4116	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R4117	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R4118	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R4119	0103843	CHIP RESISTOR 1.0KOHM+-5% 0.1W
R4120	0103843	CHIP RESISTOR 1.0KOHM+-5% 0.1W
R4121	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R4123	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4129	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R4130	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R4132	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R4133	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R4134	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4137	0104271	CHIP RESISTOR 15KOHM+-1% 1/10W
R4138	0104112	CHIP RESISTOR 47KOHM+-1% 0.1W
R4140	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R4141	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R4148	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R4149	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R4215	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R4216	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R4301	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4303	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R4304	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R4305	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4307	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4309	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4310	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R4316	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R4317	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R4322	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R4323	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R4327	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R4328	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R4329	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R4330	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R4331	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R4335	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R4336	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R4337	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R4338	0105147	CHIP RESISTOR 100KOHM+-1% 1/10W
R4339	0103866	CHIP RESISTOR 82KOHM+-5% 0.1W
R4340	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R4341	0103869	CHIP RESISTOR 150KOHM+-5% 0.1W
R4342	0700027	CARBON FILM 100 OHM+-5% 1/8W
R4344	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R4345	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R4346	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R4347	0103838	RESISTOR CHIP 390 OHM+-5% 0.1W
R4348	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R4349	0103834	CHIP RESISTOR 180 OHM+-5% 0.1W
R4350	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R4351	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R4352	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R4353	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4354	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R4363	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R4364	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4365	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R4368	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R4369	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
RT0351	AW10163	SEMI VARIABLE 470 OHM
		SEMI-CONDUCTORS
D4101	5339071	DIODE 1SS119
D4102	5339071	DIODE 1SS119
D4301	CH11171M	DIODE AK04
D4302	5339071	DIODE 1SS119
D4303	5339071	DIODE 1SS119
IC0351	CK13503R	IC NJM2535M
IC0352	1345911	IC TL8828P
IC4101	CK15468R	IC MB90089-214(HEPM)
IC4102	CK13503R	IC NJM2535M
IC4103	1352032	IC NJM2249M
IC4301	CP12219	IC M37272M8-122SP(HEPM)
IC4302	CK14883	IC AT24C16N
IC4303	CK19602R	IC RN5VS45AA
IC4304	CK11252	IC MM1108XFFE
Q0351	CA10581R	TRANSISTOR 2SB709A
Q0352	CA10572R	TRANSISTOR 2SD601A
Q0353	CA10581R	TRANSISTOR 2SB709A
Q0354	CA10672R	TRANSISTOR 2SD601A
Q0355	CA10672R	TRANSISTOR 2SD601A
Q0356	CA10581R	TRANSISTOR 2SB709A
Q4101	CA10672R	TRANSISTOR 2SD601A
Q4102	CA10672R	TRANSISTOR 2SD601A
Q4103	CA10672R	TRANSISTOR 2SD601A
Q4104	CA10672R	TRANSISTOR 2SD601A
Q4105	CA10672R	TRANSISTOR 2SD601A
Q4107	CA10582R	TRANSISTOR 2SB709A
Q4108	CA10672R	TRANSISTOR 2SD601A
Q4109	CA10582R	TRANSISTOR 2SB709A
Q4110	CA10672R	TRANSISTOR 2SD601A
Q4111	5326903	TRANSISTOR UN2213
Q4112	5326904	TRANSISTOR UN2113
Q4113	5326904	TRANSISTOR UN2113
Q4114	5326903	TRANSISTOR UN2213
Q4115	CA10672R	TRANSISTOR 2SD601A

SYMBOL NO	P-NO	DESCRIPTION
Q4116	5326903	TRANSISTOR UN2213
Q4303	CA10672R	TRANSISTOR 2SD601A
Q4304	CA10672R	TRANSISTOR 2SD601A
Q4305	CA10672R	TRANSISTOR 2SD601A
Q4306	CA10672R	TRANSISTOR 2SD601A
Q4310	5326903	TRANSISTOR UN2213
Q4313	CA10672R	TRANSISTOR 2SD601A
Q4314	CA10672R	TRANSISTOR 2SD601A
ZD4301	5339297	DIODE HZS5C3
		COILS
L0354	5159149	CHOKE COIL 47UH
L0355	5159149	CHOKE COIL 47UH
L0356	5159146	CHOKE COIL 27UH
L0357	5159146	CHOKE COIL 27UH
L0358	5159152	CHOKE COIL 68UH
L4101	5159145	CHOKE COIL 22UH
L4102	5121289	COIL 22UH
L4301	0770057	CHOKE COIL 100UH+-5%
L4302	0770057	CHOKE COIL 100UH+-5%
		CRYSTALS
X0351	BP10841S	CRYSTAL
X4101	BP10831R	CRYSTAL(HEPM)
X4102	BP10832R	CRYSTAL(HEPM)
X4301	BP10381R	CRYSTAL
		MISCELLANEOUS
BL4301	BZ10471R	CORE
TH0351	5340451	THERMISTOR

CHAPTER 6 SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS/ MICROPROCESSOR PIN FUNCTION TABLES

Cautions when using schematic diagrams

Caution for safety

The parts marked ⚠ are critical for safety. Be sure to use the specified parts to ensure safety when replacing them.

1. Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations.

[Resistors]

Item	Indication
Value	No indication ..... Ω K ..... k Ω M ..... M Ω
Tolerance	No indication ..... ±5% (All tolerances other than ± 5% are indicated in the schematic diagrams)
Power capacitance	No indication ..... 1/8W (1/16W for leadless resistors without indication) All capacitances other than the above are indicated in the schematic diagrams.

[Capacitors]

Item	Indication
Value	No indication ..... μF P ..... pF
Dielectric strength	No indication ..... 50V (All dielectric strengths other than 50V are indicated in the schematic diagrams.)

[Coils]

Item	Indication
Value	μ ..... μH m ..... mH

Cautions when using circuit board diagrams

1. Identifications of sides A/B in circuit board diagrams

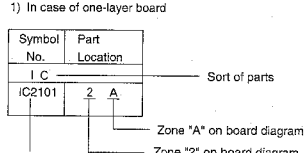
1) Board having a pattern on one side and parts on both sides.
   - Side A: Shows discrete parts, viewed from the pattern side.
   - Side B: Shows leadless parts, viewed from the pattern side.

2) Board having patterns on both sides and parts on both sides.
   - Side A: Shows parts and patterns which can be seen when the case is opened.
   - Side B: Shows parts and the pattern on the back of side A.

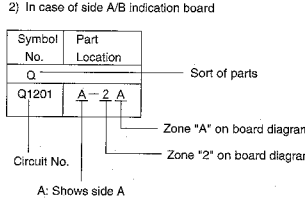
2. Table for indexing locations of parts

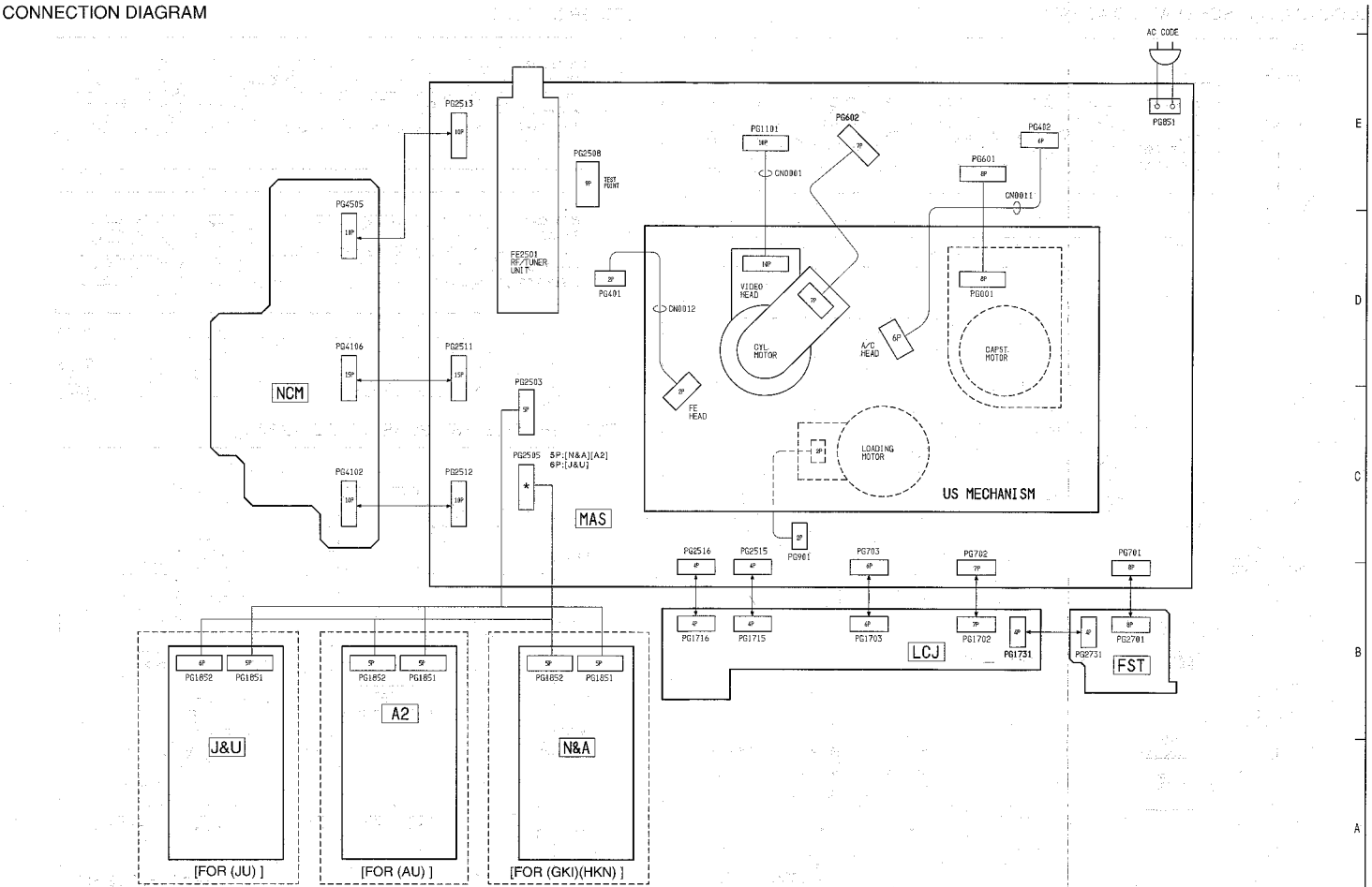
This table shows locations of each part on the circuit board diagrams. The locations are indicated using the guide scales on the external lines of diagrams.

1) In case of one-layer board

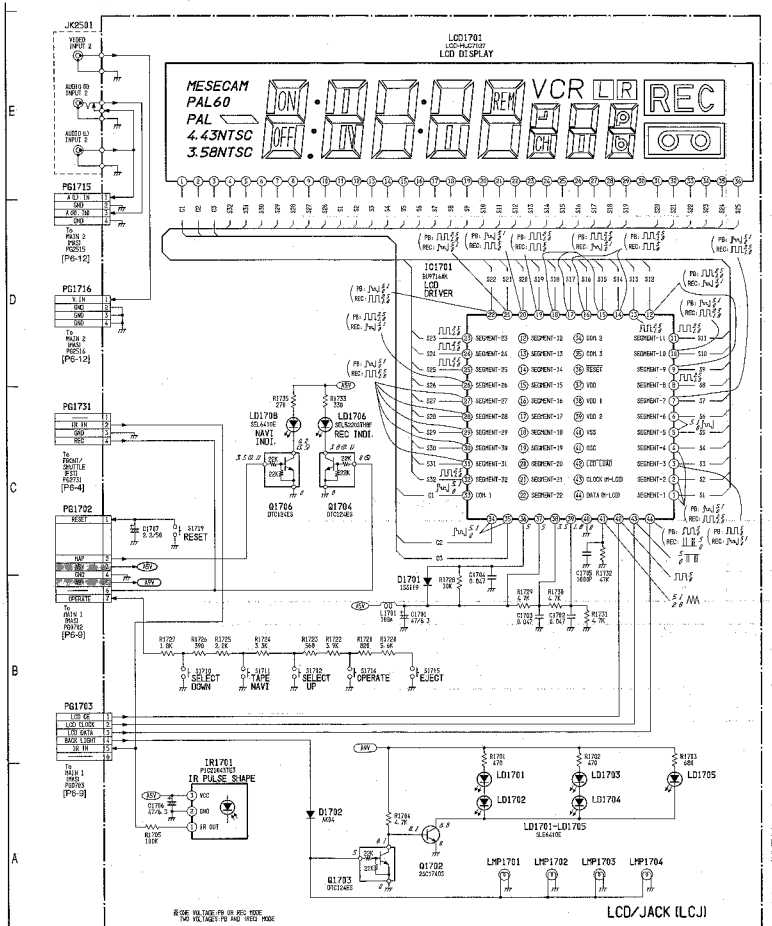


2) In case of side A/B indication board

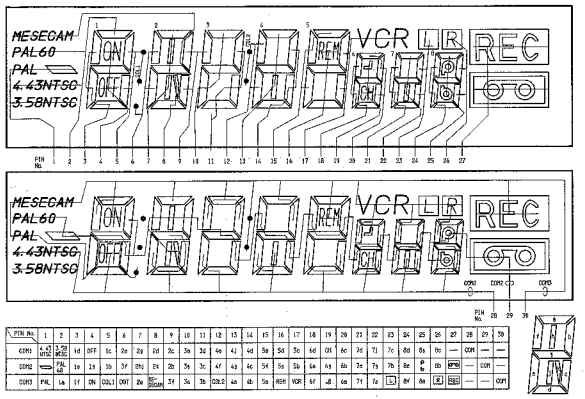



AC CODE
PG851
PG2513
PG2508
TEST POINT
FE2501 RF/TUNER UNIT
PG1101
CN0001
PG602
PG402
PG601
CN0011
PG4505
PG401
CN0012
VIDEO HEAD
CYL. MOTOR
A/C HEAD
PG001
CAPST. MOTOR
FE HEAD
NCM
PG4106
PG2511
PG2503
PG2505
5P:[N&A][A2]
6P:[J&U]
MAS
PG4102
PG2512
LOADING MOTOR
US MECHANISM
PG901
PG2516
PG2515
PG703
PG702
PG701
PG1716
PG1715
PG1703
PG1702
PG1731
PG2731
PG2701
LCJ
FST
PG1852
PG1851
J&U
A2
N&A
[FOR (JU)]
[FOR (AU)]
[FOR (GKI)(HKN)]

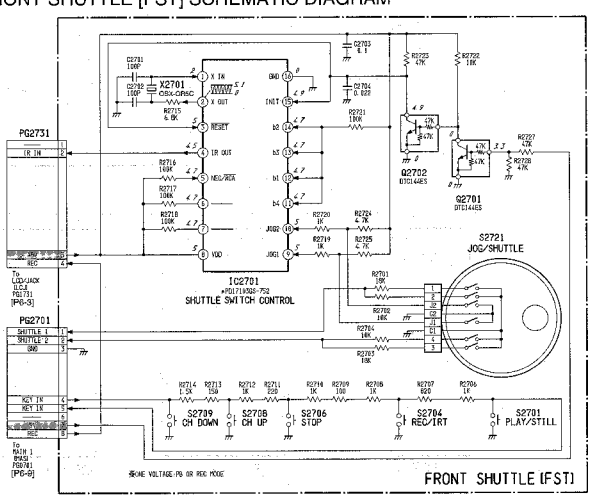
LCD/JACK [LCJ] SCHEMATIC DIAGRAM



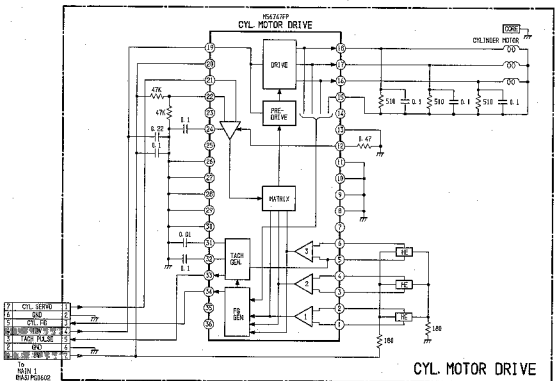
LCD GRID TABLE



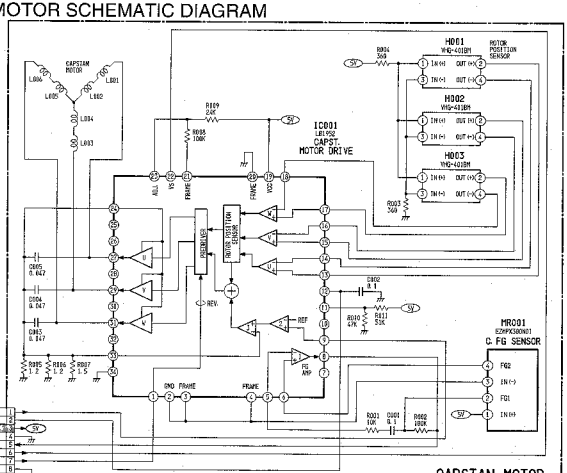
FRONT SHUTTLE [FST] SCHEMATIC DIAGRAM



CYL. MOTOR DRIVE SCHEMATIC DIAGRAM

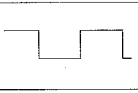


CAPSTAN MOTOR SCHEMATIC DIAGRAM

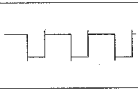


SERVO WAVEFORMS

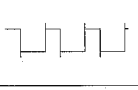
1-A IC901-24 5.0Vp-p
1V/5.0msec.cm
REC/PLAY



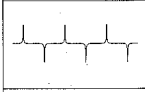
2-A IC901-31 5.4Vp-p
1V/5.0msec.cm
REC



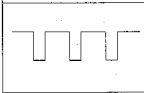
3-A IC901-32 5.4Vp-p
1V/5.0msec.cm
REC



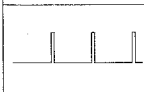
4-B IC901-37 2.7Vp-p
500mV/10.0msec.cm
RLAY



5-A IC901-38 4.6Vp-p
1V/500µsec.cm
REC/PLAY

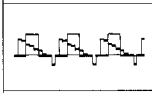


6-A IC901-39 4.8Vp-p
1V/10.0msec.cm
REC/PLAY

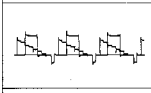


Y/CHROMA WAVEFORMS

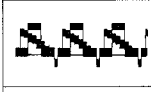
1-A IC201-21 320mVp-p
0.2V/20.0µsec.cm
REC



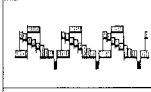
1-B IC201-21 320mVp-p
0.2V/20.0µsec.cm
PLAY



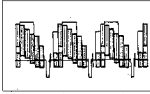
2-A IC201-26 530mVp-p
0.2V/20.0µsec.cm
REC



2-B IC201-26 530mVp-p
0.2V/20.0µsec.cm
RLAY



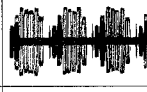
3-A IC102-28 1.0Vp-p
0.5V/20.0µsec.cm
REC



4-A IC201-52 2.2Vp-p
0.5V/20.0µsec.cm
REC

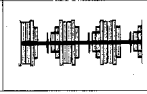
4-B IC201-52 2.2Vp-p
0.5V/20.0µsec.cm
PLAY

5-B IC201-54 300mVp-p
0.1V/20.0µsec.cm
PLAY

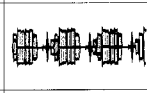


6-B IC201-55 300mVp-p
0.2V/20.0µsec.cm
PLAY

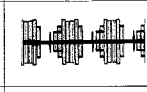
7-A IC201-58 180mVp-p
0.2V/20.0µsec.cm
REC



7-B IC201-58 200mVp-p
0.2V/20.0µsec.cm
PLAY

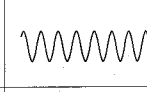


8-A IC201-60 140mVp-p
0.1V/20.0µsec.cm
REC

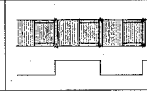


8-B IC201-60 160mVp-p
0.1V/20.0µsec.cm
PLAY

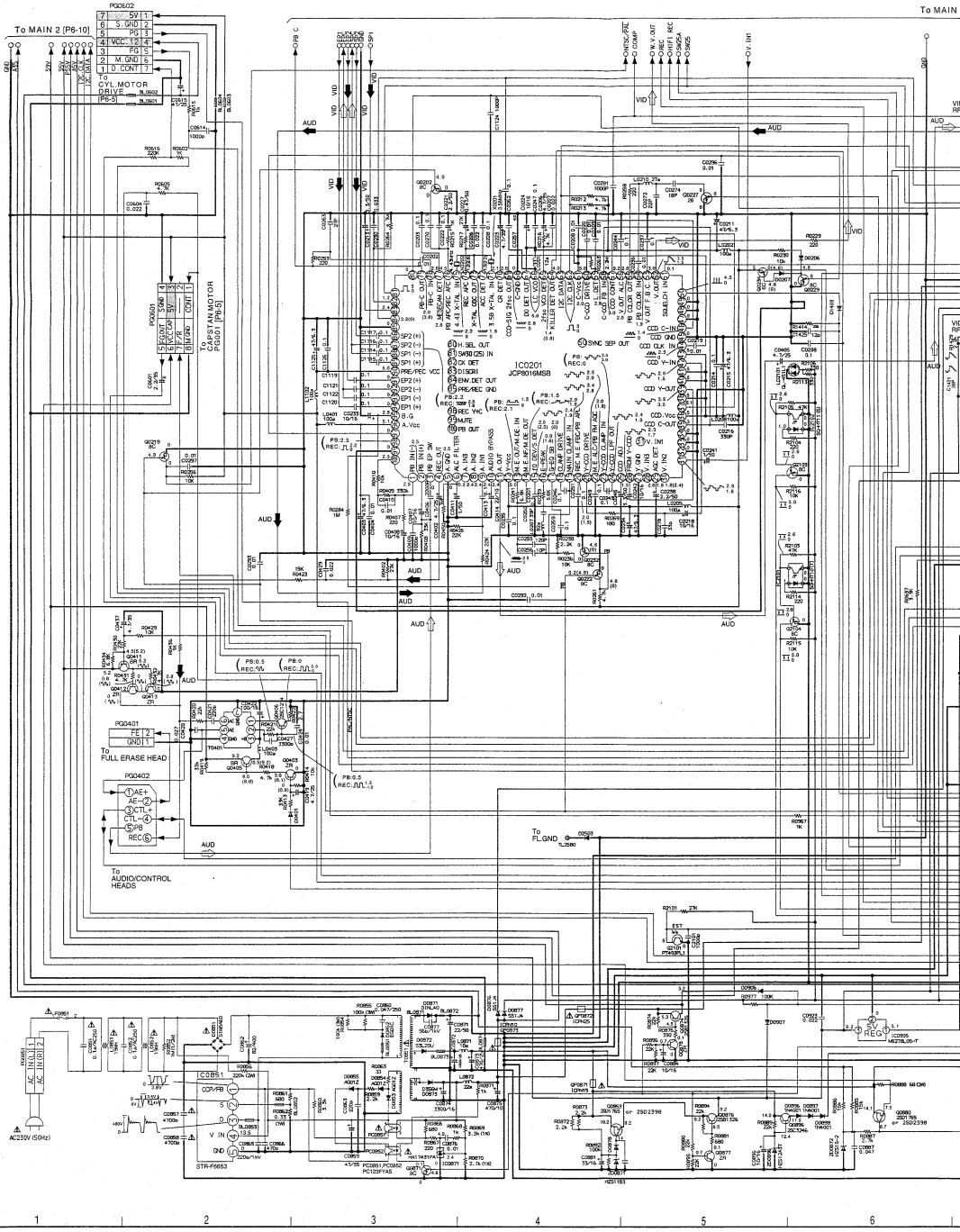
9-A IC201-69 450mVp-p
0.2V/100nsec.cm
REC/PLAY

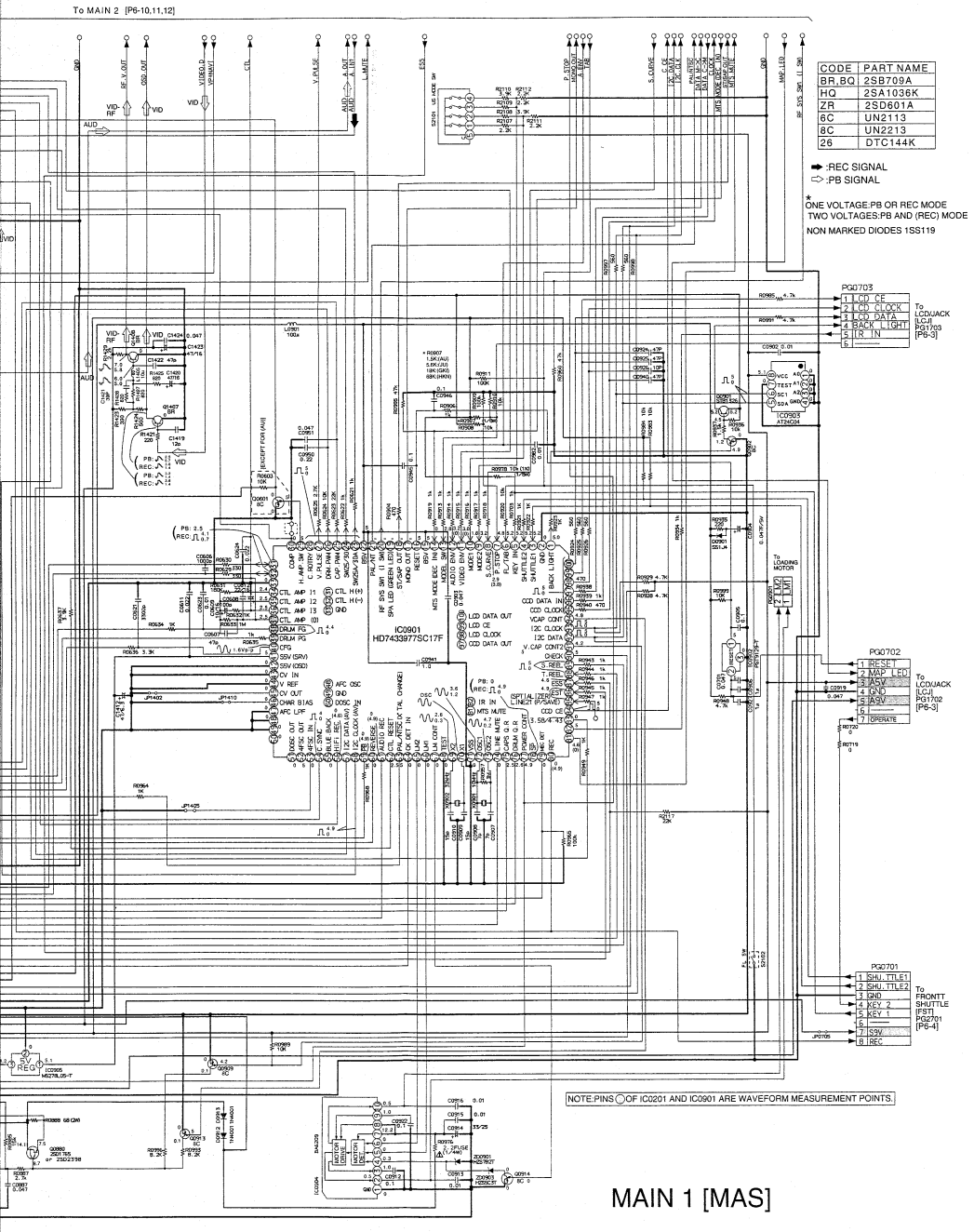


10-B IC201-78 1.0Vp-p
0.5V/5.0msec.cm
PLAY

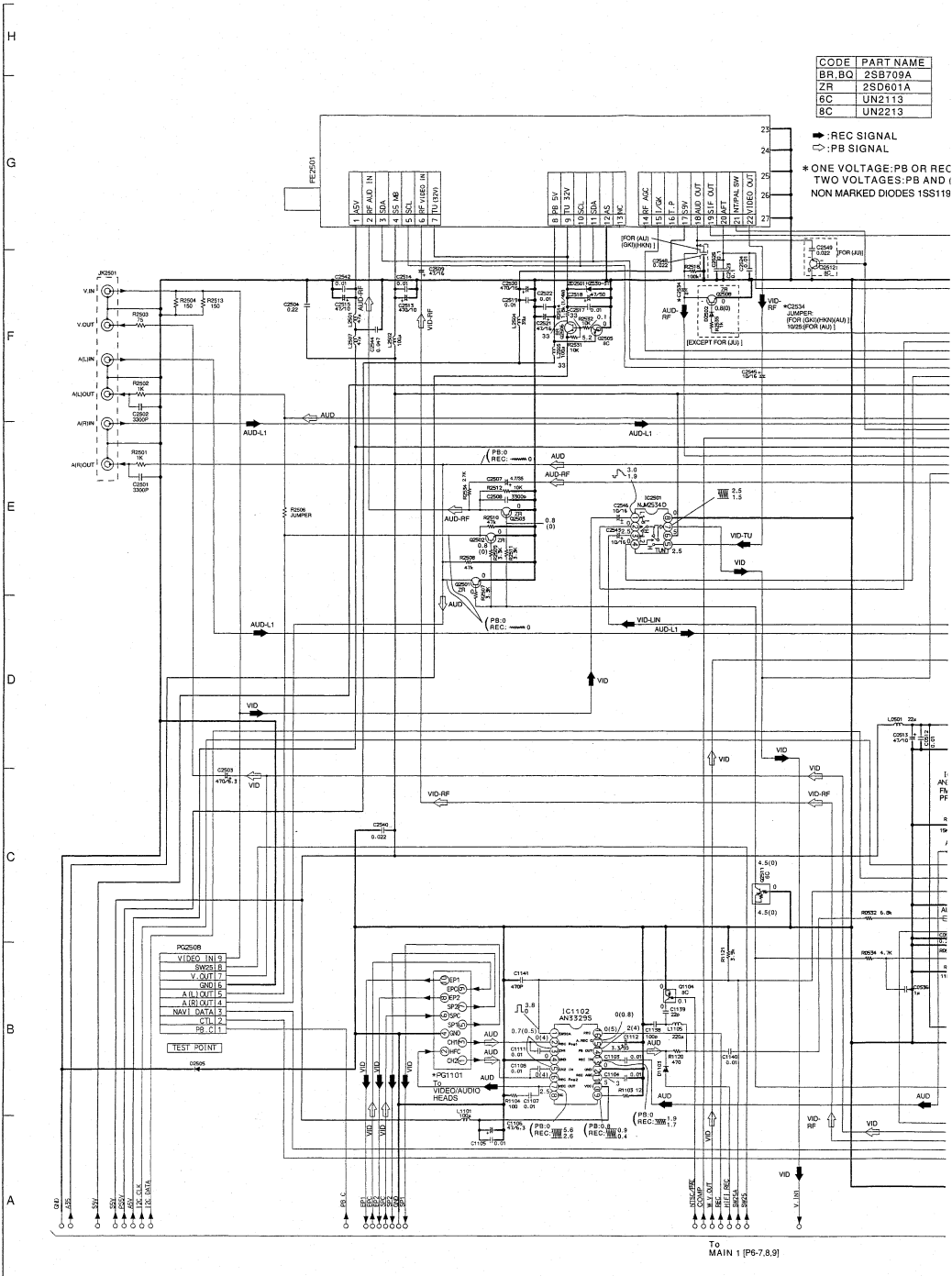


MAIN 1 [MAS] SCHEMATIC DIAGRAM




To MAIN 2 [P6-10,11,12]
CODE | PART NAME
BR,BQ | 2SB709A
HQ | 2SA1036K
ZR | 2SD601A
6C | UN2113
8C | UN2213
26 | DTC144K
:REC SIGNAL
:PB SIGNAL
ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE
NON MARKED DIODES 1SS119
PG0703
1 LCD CE
2 LCD CLOCK
3 LCD DATA
4 BACK LIGHT
5 IR IN
6
To LCD/JACK [LCJ] PG1703 [PB-3]
PG0702
1 RESET
2 MAP LED
3 ASV
4 GND
5 ASV
6
7 OPERATE
To LCD/JACK [LCJ] PG1702 [PB-3]
PG0701
1 SHU. TTLE1
2 SHU. TTLE2
3 GND
4 KEY 2
5 KEY 1
6
7 SSV
8 REC
To FRONTT SHUTTLE [FST] PG2701 [PB-4]
IC0901
HD7433977SC17F
MAIN 1 [MAS]
NOTE:PINS ○ OF IC0201 AND IC0901 ARE WAVEFORM MEASUREMENT POINTS.

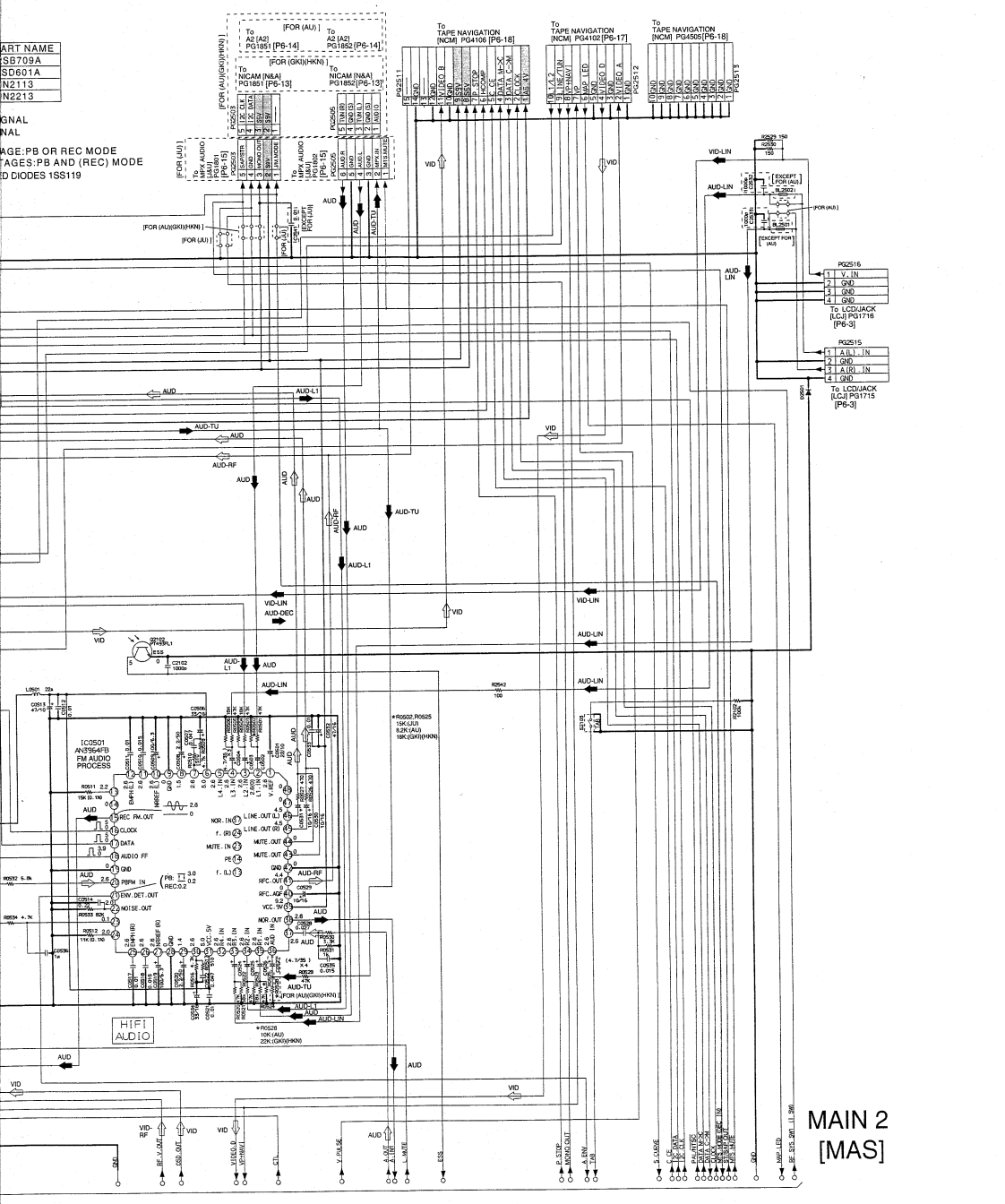
MAIN 2 [MAS] SCHEMATIC DIAGRAM



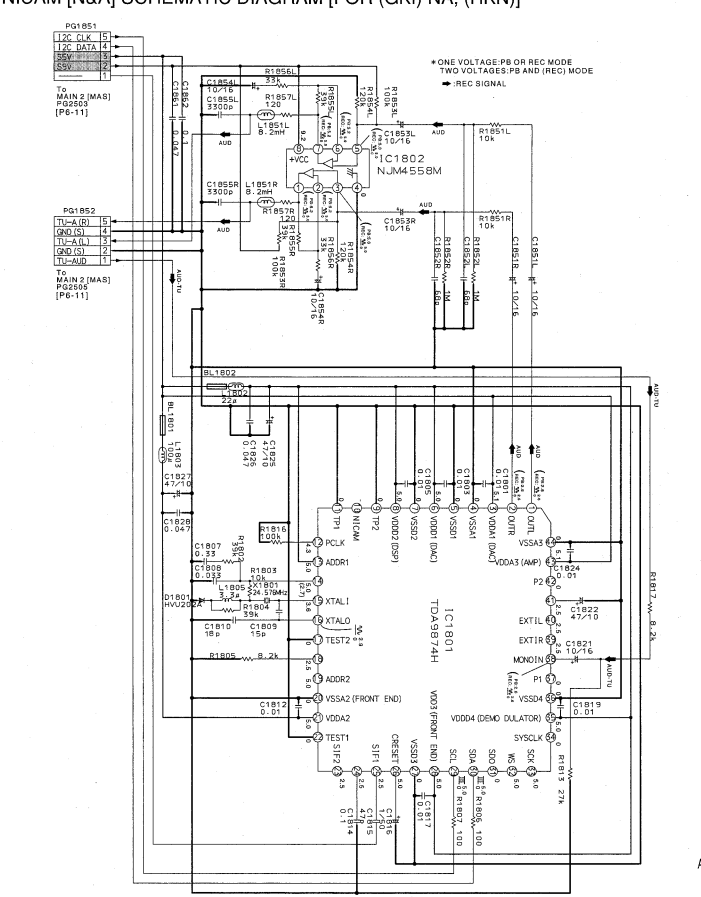
ART NAME
SB709A
SD601A
N2113
N2213

GNAL
NAL

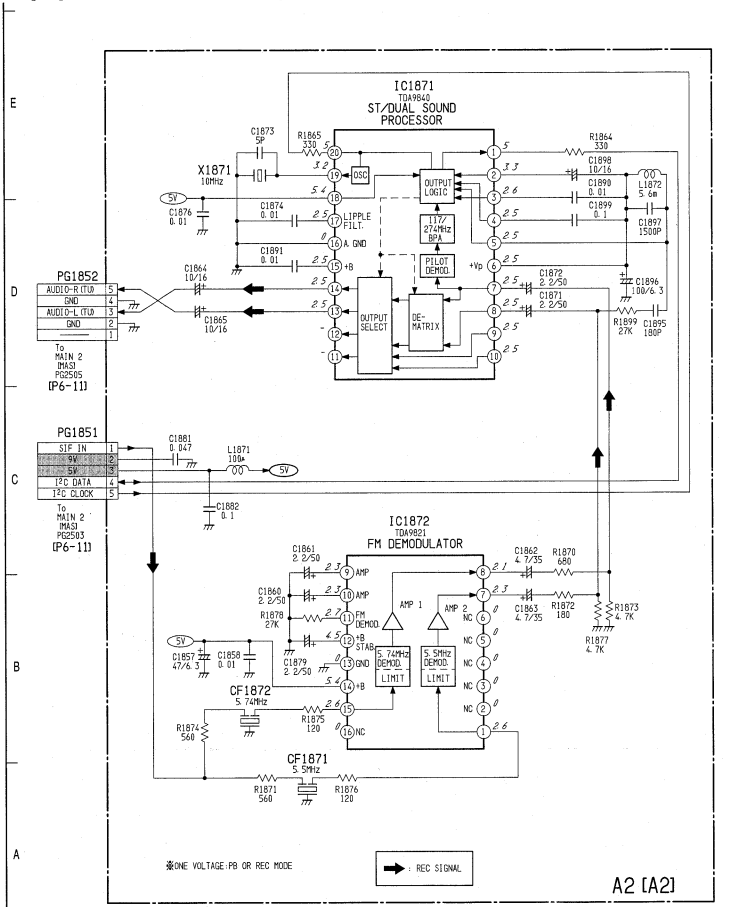
AGE:PB OR REC MODE
TAGES:PB AND (REC) MODE
D DIODES 1SS119



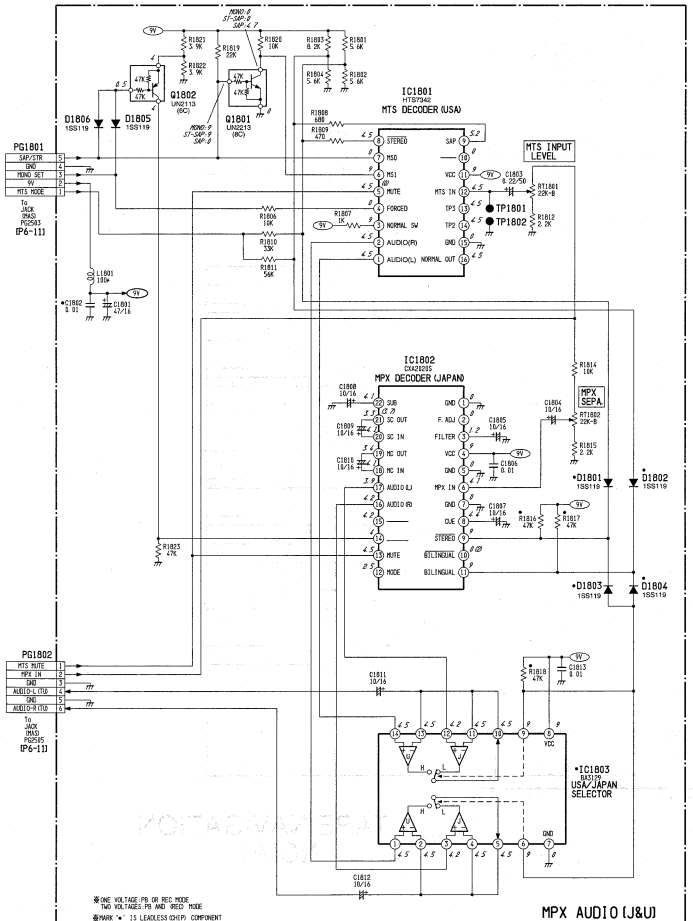
NICAM [N&A] SCHEMATIC DIAGRAM [FOR (GKI) NA, (HKN)]



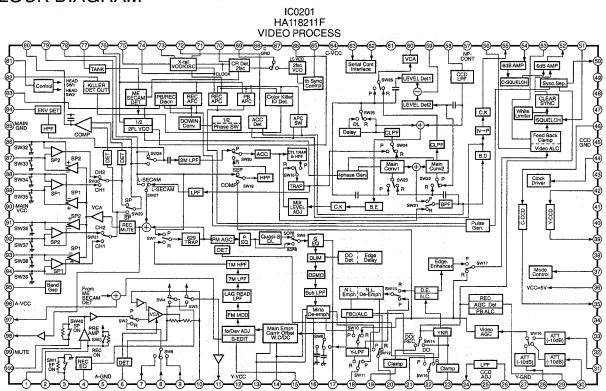
A2 [A2] SCHEMATIC DIAGRAM [FOR (AU)]

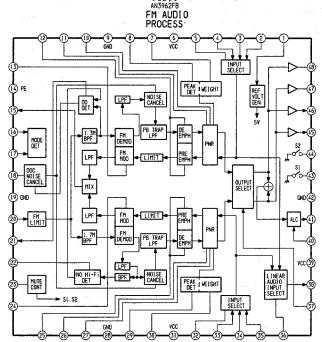


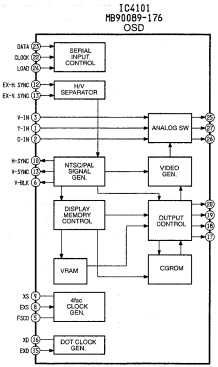
MPX AUDIO [J&U] SCHEMATIC DIAGRAM [FOR (JU)]

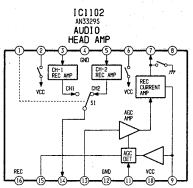


IC BLOCK DIAGRAM

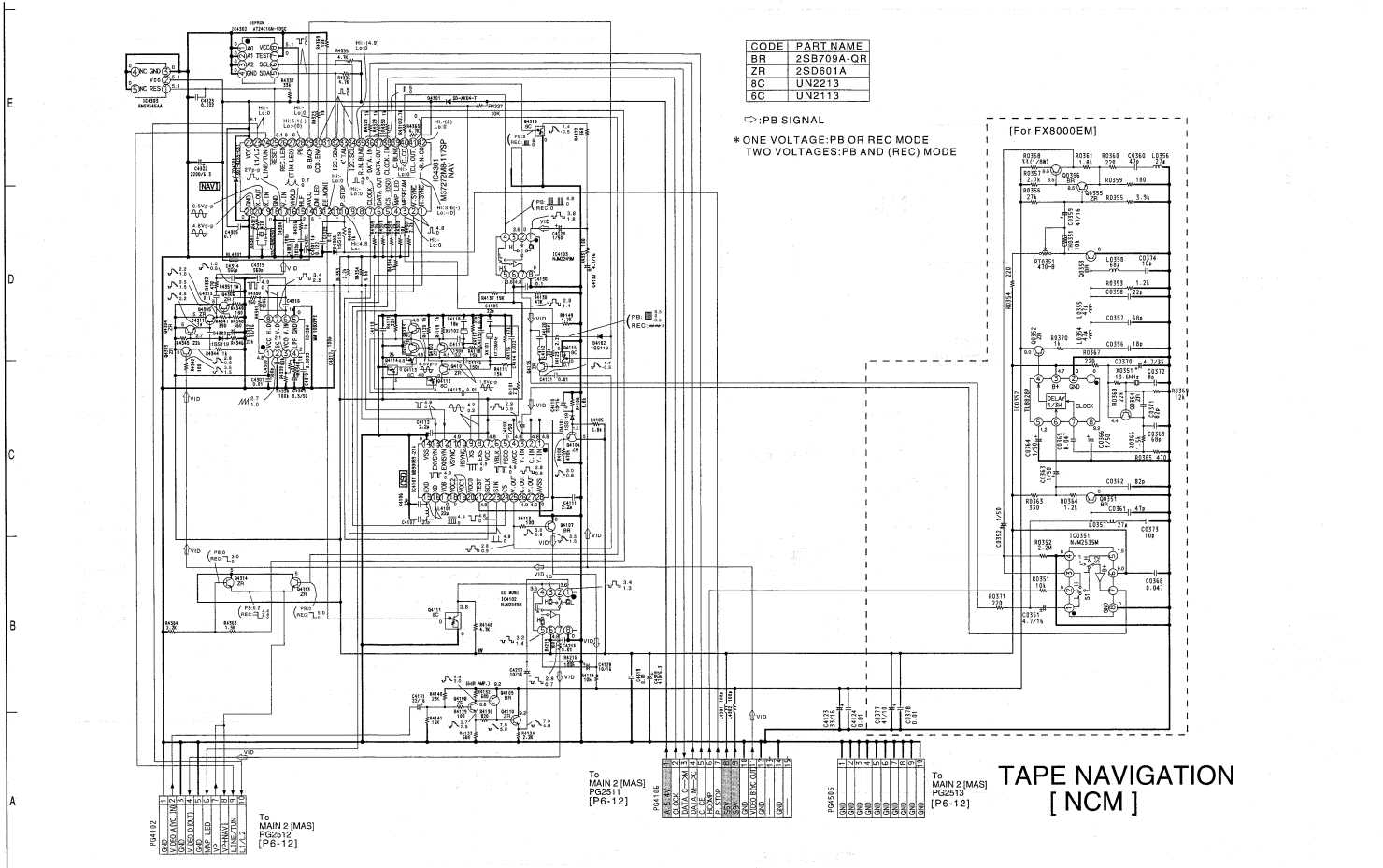




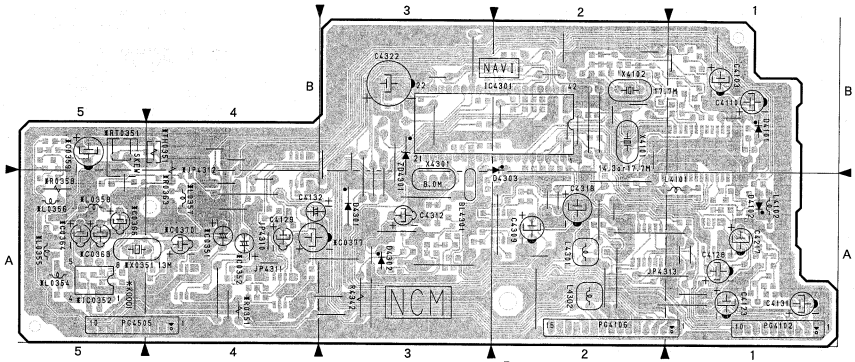




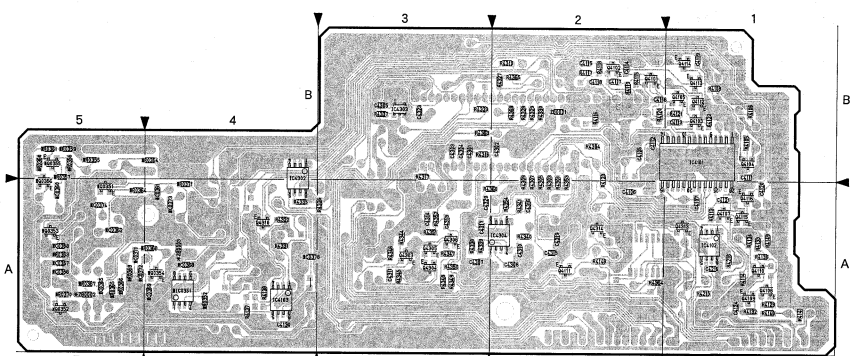
TAPE NAVIGATION [NCM] SCHEMATIC DIAGRAM



NCM CIRCUIT BOARD



NCM [TAPE NAVIGATION] —SIDE A—



NCM [TAPE NAVIGATION] —SIDE B—

[PATTERN No. JK1359-5]

DIFFERENCE TABLE

NOTE: This table listes the different components marked with asterisks (*) in the circuit board diagrams.

-SIDE A-

SYMBOL No.	FX8000EM	FX8000E
C0351	○	×
C0352	○	×
C0359	○	×
C0363	○	×
C0364	○	×
C0366	○	×
C0370	○	×
C0377	○	×
IC0352	○	×
JP4312	×	○
L0354	○	×
L0355	○	×
L0356	○	×
L0357	○	×
L0358	○	×
R0351	○	×
R0358	○	×
R0363	○	×
RT0351	○	×
TH0351	○	×
X0351	○	×
K0001	×	○

-SIDE B-

SYMBOL No.	FX8000EM	FX8000E
C0356	○	×
C0357	○	×
C0358	○	×
C0360	○	×
C0361	○	×
C0362	○	×
C0365	○	×
C0368	○	×
C0369	○	×
C0371	○	×
C0372	○	×
C0373	○	×
C0374	○	×
C0378	○	×
IC0351	○	×
Q0351	○	×
Q0352	○	×
Q0353	○	×
Q0354	○	×
Q0355	○	×
Q0356	○	×
R0352	○	×
R0353	○	×
R0354	○	×
R0355	○	×
R0356	○	×
R0357	○	×
R0359	○	×
R0360	○	×
R0361	○	×
R0364	○	×
R0365	○	×
R0366	○	×
R0367	○	×
R0368	○	×
R0369	○	×
R0370	○	×
R0371	○	×
ZB002	○	×
ZB003	×	○

IDENTIFICATION OF PARTS LOCATION

Symbol No.	Parts Location
BL	
BL4301	A-3A
C	
C0351	A-4A
C0352	A-4A
C0356	B-5A
C0357	B-5A
C0358	B-5A
C0359	A-5B
C0360	B-5A
C0361	B-4A
C0362	B-5A
C0363	A-5A
C0364	A-5A
C0365	B-5A
C0366	A-5A
C0368	B-4A
C0369	B-4A
C0370	A-4A
C0371	B-5A
C0372	B-5A
C0373	B-4A
C0374	B-5A
C0377	A-4A
C0378	B-4A
C4103	A-1B
C4105	B-2B
C4106	B-2A
C4107	B-1A
C4110	A-1B
C4111	B-1B
C4112	B-2B
C4113	B-1B
C4114	B-2B
C4115	B-2B
C4116	B-2B
C4117	B-2B
C4118	B-2B
C4119	B-1B
C4120	B-1A
C4121	B-1A
C4123	A-1A
C4124	B-1A
C4128	A-1A
C4129	A-4A
C4130	B-4A
C4131	A-1A
C4132	A-4A
C4216	B-1A
C4217	A-1A
C4301	B-3B
C4302	B-2B
C4303	B-3B
C4304	B-3B
C4305	B-3B
C4307	B-3A
C4308	B-2A
C4309	A-2A
C4310	B-2A
C4311	B-3A
C4312	A-3A
C4313	B-3A
C4314	B-3A
C4315	B-2A
C4316	B-2A
C4317	B-3A
C4318	A-2A
C4319	B-2A
C4322	A-3B
C4323	B-3B
C4329	B-3A
D	
D4101	A-1B
D4102	A-1A
D4301	A-3A
D4302	A-3A
D4303	A-2B
IC	
IC0351	B-4A
IC0352	A-5A
IC4101	B-1B
IC4102	B-1A
IC4103	B-4A
IC4301	A-2B
IC4302	B-4B
IC4303	B-3B
IC4304	B-2A
JP	
JP4312	A-4A
K	
K0001	A-5A
L	
L0354	A-5A
L0355	A-5A
L0356	A-5A
L0357	A-4A
L0358	A-5A
L4101	A-1A
L4102	A-1A
L4301	A-2A
L4302	A-2A
PG	
PG4102	A-1A
PG4106	A-2A
PG4505	A-5A
Q	
Q0351	B-5A
Q0352	B-5A
Q0353	B-5A
Q0354	B-4A
Q0355	B-5B
Q0356	B-5A
Q4101	B-2B
Q4102	B-2B
Q4103	B-1B
Q4104	B-1B
Q4105	B-1B
Q4107	B-1A
Q4108	B-1A
Q4109	B-1A
Q4110	B-1A
Q4111	B-2A
Q4112	B-1B
Q4113	B-1B
Q4114	B-1B
Q4115	B-1A
Q4116	B-1A
Q4303	B-3A
Q4304	B-3A
Q4305	B-3A
Q4306	B-3A
Q4310	B-4A
Q4313	B-1A
Q4314	B-2A
R	
R0351	A-4A
R0352	B-4A
R0353	B-5A
R0354	B-4B
R0355	B-5B
R0356	B-5B
R0357	B-5B
R0358	A-5A
R0359	B-5B
R0360	B-5B
R0361	B-5B
R0363	A-4A
R0364	B-5A
R0365	B-5A
R0366	B-5A
R0367	B-5A
R0368	B-4A
R0369	B-5A
R0370	B-5A
R0371	B-4A
R4105	B-1B
R4106	B-1B
R4108	B-1B
R4113	B-1A
R4114	B-1A
R4115	B-2B
R4116	B-2B
R4117	B-2B
R4118	B-2B
R4119	B-2B
R4120	B-2B
R4121	B-1B
R4122	B-1B
R4123	B-2B
R4129	B-1A
R4130	B-1A
R4132	B-1A
R4133	B-1A
R4134	B-1A
R4137	B-4A
R4138	B-4A
R4140	B-1A
R4141	B-1A
R4148	B-2A
R4149	B-1A
R4215	B-1A
R4216	B-1A
R4301	B-2A
R4303	B-2A
R4304	B-2B
R4305	B-2A
R4307	B-2A
R4309	B-2A
R4310	B-2B
R4316	B-3B
R4317	B-3B
R4322	B-4A
R4323	B-3B
R4327	B-2B
R4328	B-2B
R4329	B-2B
R4330	B-2B
R4331	B-4A
R4335	B-4A
R4336	B-3A
R4337	B-3B
R4338	B-3A
R4339	B-3A
R4340	B-2A
R4341	B-2A
R4342	A-3A
R4344	B-3A
R4345	B-3A
R4346	B-3A
R4347	B-3A
R4348	B-3A
R4349	B-3A
R4350	B-3A
R4351	B-3A
R4352	B-3A
R4353	B-2A
R4354	B-2A
R4363	B-3B
R4364	B-2A
R4385	B-2B
R4388	B-3A
R4389	B-2B
RT	
RT0351	A-5B
TH	
TH0351	A-4B
X	
X0351	A-5A
X4101	A-2B
X4102	A-2B
X4301	A-3A
ZB	
ZB0002	B-5A
ZB0003	B-4A
ZD	
ZD4301	A-3B

IDENTIFICATION OF PARTS LOCATION

MAS [MAIN]

Symbol No.	Parts Location
#	
#2501	A-5H
BL	
BL0601	A-2G
BL0602	A-3G
BL0603	A-1E
BL0604	A-1E
BL0851	A-2H
BL0852	A-2H
BL0853	A-2H
BL0854	A-2G
BL0871	A-4H
BL0872	A-4H
BL0873	A-4H
BL0874	A-4G
BL2501	A-6B
BL2502	A-6A
C	
C0201	B-3C
C0202	B-2C
C0203	A-1C
C0206	A-2C
C0207	B-2C
C0208	B-2B
C0209	B-2C
C0211	A-2B
C0213	A-2C
C0214	B-3C
C0215	A-3C
C0216	B-3C
C0218	A-2B
C0219	B-2C
C0220	A-2C
C0221	A-1C
C0222	B-1C
C0223	A-2C
C0224	A-2C
C0226	B-1C
C0227	A-1C
C0228	B-2C
C0230	B-2C
C0233	A-2D
C0234	A-3D
C0235	B-2D
C0236	B-2B
C0237	B-2B
C0238	A-3C
C0241	A-3C
C0242	A-2C
C0243	B-3C
C0244	B-2C
C0245	A-3C
C0246	B-3C
C0247	B-2B
C0249	B-3C
C0250	B-3C
C0251	B-3C
C0255	B-3D
C0256	B-2D
C0257	B-2C
C0259	B-3C
C0262	B-1C
C0263	B-1C
C0270	B-1C
C0273	B-2B
C0274	B-2B
C0278	B-2B
C0291	B-2C
C0292	B-3G
C0293	B-1C
C0296	B-2E
C0297	B-2C
C0298	B-4E
C0402	A-2D
C0403	A-2D
C0404	B-2D
C0405	A-3D
C0406	B-2D
C0407	A-2D
C0408	A-2D
C0409	B-2D
C0410	B-2D
C0411	A-2D
C0413	B-2D
C0414	A-3D
C0419	A-1F
C0420	A-1F
C0421	B-1F
C0422	A-1F
C0424	B-1F
C0427	B-1F
C0429	B-2D
C0437	A-1F
C0501	A-3D
C0502	A-3D
C0503	A-2D
C0504	A-2E
C0506	A-2E
C0507	B-2E
C0508	A-2E
C0509	A-3E
C0510	B-3E
C0511	B-3E
C0512	B-3D
C0513	A-3E
C0514	B-3E
C0517	B-3E
C0518	B-3E
C0519	A-3E
C0520	A-3E
C0521	B-3E
C0522	B-3E
C0524	A-3E
C0525	A-3E
C0526	A-3E
C0527	A-3E
C0528	A-3D
C0529	A-3D
C0530	A-3D
C0531	A-3D
C0532	A-3D
C0533	B-3D
C0534	A-3E
C0535	B-3D
C0536	B-3E
C0601	A-1E
C0604	B-1E
C0606	B-5E
C0607	B-5D
C0608	B-5D
C0609	A-5D
C0611	B-5D
C0612	A-5D
C0614	B-1E
C0615	A-1E
C0621	A-4D
C0623	B-5D
C0624	B-5D
C0701	B-6G
C0851	A-1H
C0852	A-1H
C0857	A-2H
C0858	A-2G
C0859	A-3H
C0860	A-2H
C0862	A-2H
C0863	A-3H
C0865	A-3H
C0866	B-2H
C0871	A-4H
C0872	A-4H
C0873	A-1F
C0874	A-4H
C0875	A-4H
C0876	B-3G
C0877	A-4H
C0881	A-5H
C0884	A-5H
C0887	A-5G
C0896	A-5H
C0902	B-6C
C0903	B-5E
C0904	A-6B
C0905	B-6G
C0906	B-6G
C0907	B-5F
C0908	B-5F
C0909	B-4F
C0910	B-4F
C0912	B-6H
C0913	B-6H
C0914	A-6H
C0915	B-6H
C0916	B-6H
C0919	B-6E
C0922	B-6H
C0923	B-5D
C0924	B-6D
C0925	B-6D
C0926	B-6D
C0927	B-6G
C0940	B-5E
C0941	B-5E
C0945	B-5E
C0946	B-5E
C0950	B-5E
C0951	B-5E
C0982	B-6D
C1103	B-1D
C1104	B-1D
C1105	B-1D
C1106	A-1D
C1107	B-1D
C1108	B-1D
C1111	B-1D
C1112	A-1C
C1114	B-1C
C1115	A-1C
C1116	B-1C
C1117	A-1C
C1119	B-1C
C1120	B-1C
C1121	B-1C
C1122	B-1C
C1124	B-1C
C1125	A-2D
C1126	A-2C
C1138	B-1D
C1139	B-2D
C1140	B-2E
C1141	B-3F
C1412	A-4E
C1419	B-5B
C1420	A-5B
C1421	B-5B
C1422	B-5B
C1423	A-5B
C1424	B-5C
C1425	B-3C
C2101	B-4G
C2102	B-4B
C2501	B-1C
C2502	B-1B
C2503	A-2B
C2504	B-5B
C2507	A-1B
C2508	B-1A
C2509	A-2A
C2513	A-1A
C2514	B-1A
C2515	A-1A
C2517	B-2A
C2518	A-2A
C2519	B-3A
C2520	A-3A
C2521	A-2A
C2522	B-2A
C2523	B-3A
C2524	B-3A
C2525	B-3A
C2532	B-6A
C2533	B-6A
C2534	A-3A
C2540	B-3B
C2541	B-5A
C2542	B-1A
C2543	A-6A
C2544	B-1A
C2545	A-3A
C2546	A-5A
C2548	B-3A
C2549	B-3A
D	
D0206	A-2E
D0207	A-2E
D0401	A-2F
D0851	A-2H
D0852	A-2H
D0853	A-3H
D0854	A-3H
D0855	A-3H
D0871	A-4H
D0872	A-4H
D0873	A-4H
D0876	A-5G
D0877	A-5F
D0878	A-5H
D0896	A-6G
D0897	A-6G
D0898	A-6G
D0901	A-6G
D0906	A-5G
D0907	A-5G
D0912	A-6G
D0913	A-6G
D1103	A-1D
D1403	A-3B
D2501	A-6B
D2502	A-4A
D2503	A-5H
D2505	A-1D
F	
F0851	A-1G
FE	
FE2501	A-1A
IC	
IC0201	B-2C
IC0501	B-3E
IC0851	A-2H
IC0871	A-3G
IC0901	B-5E
IC0902	A-6G
IC0903	A-6C
IC0904	A-6H
IC0905	A-5D
IC1102	B-1D
IC2101	A-5F
IC2102	A-5D
IC2501	A-5B
JK	
JK2501	A-1B
JP	
JP0204	B-2B
JP0601	B-5E
JP2519	B-5A
JP2520	A-4A
JP2521	A-3A
JP2522	A-5A
JP2523	A-4A
JP2524	A-4A
JP2529	B-3A
JP2549	A-5A
K	
K0436	A-1E
L	
L0201	A-2C
L0202	A-2B
L0205	A-3C
L0207	A-3C
L0208	A-2B
L0210	A-2B
L0403	A-1F
L0501	A-3E
L0851	A-1H
L0852	A-1H
L0871	A-4G
L0872	A-4H
L0901	A-5G
L1101	A-2D
L1102	A-2D
L1105	A-2D
L1405	A-5B
L2501	A-1A
L2502	A-3B
L2504	A-3A
L2505	A-3A
L2507	A-5A
LD	
LD2101	A-4D
PC	
PC0851	A-3H
PC0852	A-3H
PG	
PG0401	A-2B
PG0402	A-1E
PG0601	A-2E
PG0602	A-1E
PG0701	A-6H
PG0702	A-6E
PG0703	A-6C
PG0851	A-1G
PG0901	A-6E
PG1101	A-1D
PG2503	A-5A
PG2505	A-5A
PG2508	A-2B
PG2511	A-5A
PG2512	A-6A
PG2513	A-2A
PG2515	A-6A
PG2516	A-6A
Q	
Q0202	B-1C
Q0219	B-2C
Q0222	B-3D
Q0227	B-2B
Q0229	B-2E
Q0232	B-3D
Q0234	B-2E
Q0403	B-1F
Q0405	B-2F
Q0406	A-1F
Q0411	B-1F
Q0412	B-1F
Q0413	B-1F
Q0601	B-5C
Q0853	A-5H
Q0871	B-5H
Q0874	A-5H
Q0876	A-5G
Q0877	B-5F
Q0880	A-5H
Q0896	A-5H
Q0901	A-6B
Q0902	B-6B
Q0909	B-5F
Q0913	B-5F
Q1104	B-1C
Q1407	B-5B
Q1408	B-5B
Q2101	A-4G
Q2102	A-4B
Q2103	B-5D
Q2104	B-5F
Q2501	B-1C
Q2502	B-1B
Q2503	B-1A
Q2504	A-3A
Q2506	A-2A
Q2508	B-4A
Q2511	B-3B
Q2512	B-3A
QF	
QF0871	A-5H
QF0872	A-5G
QF0873	A-5F
R	
R0212	B-2C
R0213	B-2C
R0215	B-1C
R0216	B-2C
R0217	B-1C
R0229	B-2C
R0230	B-2E
R0236	B-3D
R0238	B-2D
R0239	B-3C
R0241	B-3C
R0253	B-1C
R0256	B-2B
R0258	B-2B
R0261	B-2D
R0263	B-2C
R0264	B-2C
R0269	B-3B
R0284	A-2D
R0402	B-2D
R0407	B-2D
R0408	B-2D
R0409	B-2D
R0410	B-2D
R0413	B-1F
R0414	B-1F
R0418	B-1F
R0419	B-2F
R0420	B-1F
R0421	B-1F
R0422	B-1F
R0423	A-2D
R0424	B-3D
R0425	B-2D
R0429	B-1F
R0430	B-1F
R0431	B-1F
R0432	B-1F
R0434	B-1F
R0450	B-2D
R0501	B-3D
R0502	B-3D
R0503	B-2D
R0504	B-2D
R0505	B-2E
R0506	B-2D
R0509	B-2E
R0510	B-2E
R0511	B-3E
R0512	B-3E
R0516	B-3E
R0517	B-3E
R0520	A-3E
R0521	B-3E
R0522	A-3E
R0523	B-3E
R0524	A-3E
R0525	A-3E
R0526	B-3D
R0527	B-3D
R0528	B-3E
R0529	A-4D
R0530	A-4D
R0531	B-3D
R0532	A-2E
R0533	B-3E
R0534	A-3E
R0602	B-1E
R0603	B-5C
R0605	B-1E
R0615	B-1E
R0616	A-1E
R0621	B-4F
R0622	B-5E
R0623	B-5E
R0624	B-5E
R0625	B-5D
R0629	B-5E
R0630	B-5E
R0631	B-5D
R0632	B-5D
R0633	B-5D
R0634	B-2F
R0635	B-3F
R0636	B-2F
R0637	B-4E
R0703	B-6D
R0852	A-1H
R0854	A-2H
R0855	A-2H
R0856	A-2H
R0859	B-3H
R0860	B-3H
R0861	A-2H
R0862	A-2H
R0863	A-3H
R0866	A-3G
R0867	A-3G
R0868	B-3G
R0869	B-3G
R0870	B-3G
R0871	B-4G
R0872	B-5H
R0873	B-5H
R0874	A-5H
R0875	A-5H
R0876	A-5H
R0880	B-4F
R0881	B-5F
R0885	A-5G
R0886	A-5G
R0887	A-5G
R0888	A-5H
R0889	B-5H
R0892	B-5H
R0894	B-5G
R0895	B-5F
R0896	A-5H
R0897	B-5H
R0904	B-4C
R0906	B-6G
R0907	A-6C
R0908	B-5F
R0909	B-5G
R0910	B-5E
R0911	B-6C
R0913	B-5E
R0914	B-6D
R0915	B-6D
R0916	B-6D
R0917	B-6D
R0918	B-4C
R0919	B-6D
R0920	A-6C
R0921	B-6E
R0922	B-6E
R0923	A-6B
R0924	B-6D
R0925	B-6D
R0926	B-6D
R0928	B-6C
R0929	B-6C
R0934	B-6D
R0935	B-6G
R0936	B-6B
R0937	B-6B
R0938	B-6D
R0939	B-6D
R0940	B-5F
R0943	B-5D
R0944	B-5F
R0945	B-5F
R0946	B-5F
R0947	B-5F
R0948	B-6G
R0949	B-5F
R0957	B-5F
R0960	A-5E
R0964	B-6D
R0965	B-2G
R0967	A-2G
R0968	B-4D
R0976	A-6H
R0977	A-5G
R0978	A-6E
R0983	B-6E
R0984	B-6E
R0985	B-6C
R0989	B-5F
R0991	B-6D
R0993	B-5F
R0995	B-6D
R0996	B-5F
R0997	B-6D
R0998	B-6D
R0999	B-6G
R1103	B-1D
R1104	B-1D
R1120	B-1D
R1121	B-3F
R1414	B-3C
R1421	B-5B
R1423	A-5B
R1425	B-5B
R1427	B-5B
R1428	B-5B
R1429	B-5B
R2101	A-4G
R2102	B-6C
R2103	B-5F
R2104	B-5D
R2105	B-5D
R2106	B-5D
R2107	B-5D
R2108	B-5D
R2109	B-5C
R2110	B-5C
R2111	B-5D
R2112	B-5D
R2113	B-5D
R2114	B-5F
R2115	B-5F
R2116	B-5D
R2117	B-6F
R2501	B-1C
R2502	A-1B
R2503	A-2B
R2504	B-1B
R2507	B-1C
R2508	B-1C
R2509	B-1B
R2510	B-1B
R2511	B-1A
R2512	B-1A
R2513	B-1B
R2514	A-2A
R2518	B-3A
R2529	B-6A
R2530	B-6A
R2531	B-2A
R2532	B-2A
R2534	B-1B
R2535	B-4B
R2542	B-4A
S	
S2101	A-5C
S2102	A-4G
S2103	A-6C
T	
T0401	A-1F
T0851	A-3H
X	
X0201	A-2C
X0202	A-2C
X0901	A-5F
X0902	A-4F
ZD	
ZD0871	A-5H
ZD0872	A-5G
ZD0896	A-5H
ZD0901	A-6H
ZD0903	A-6H
ZD2501	A-2A

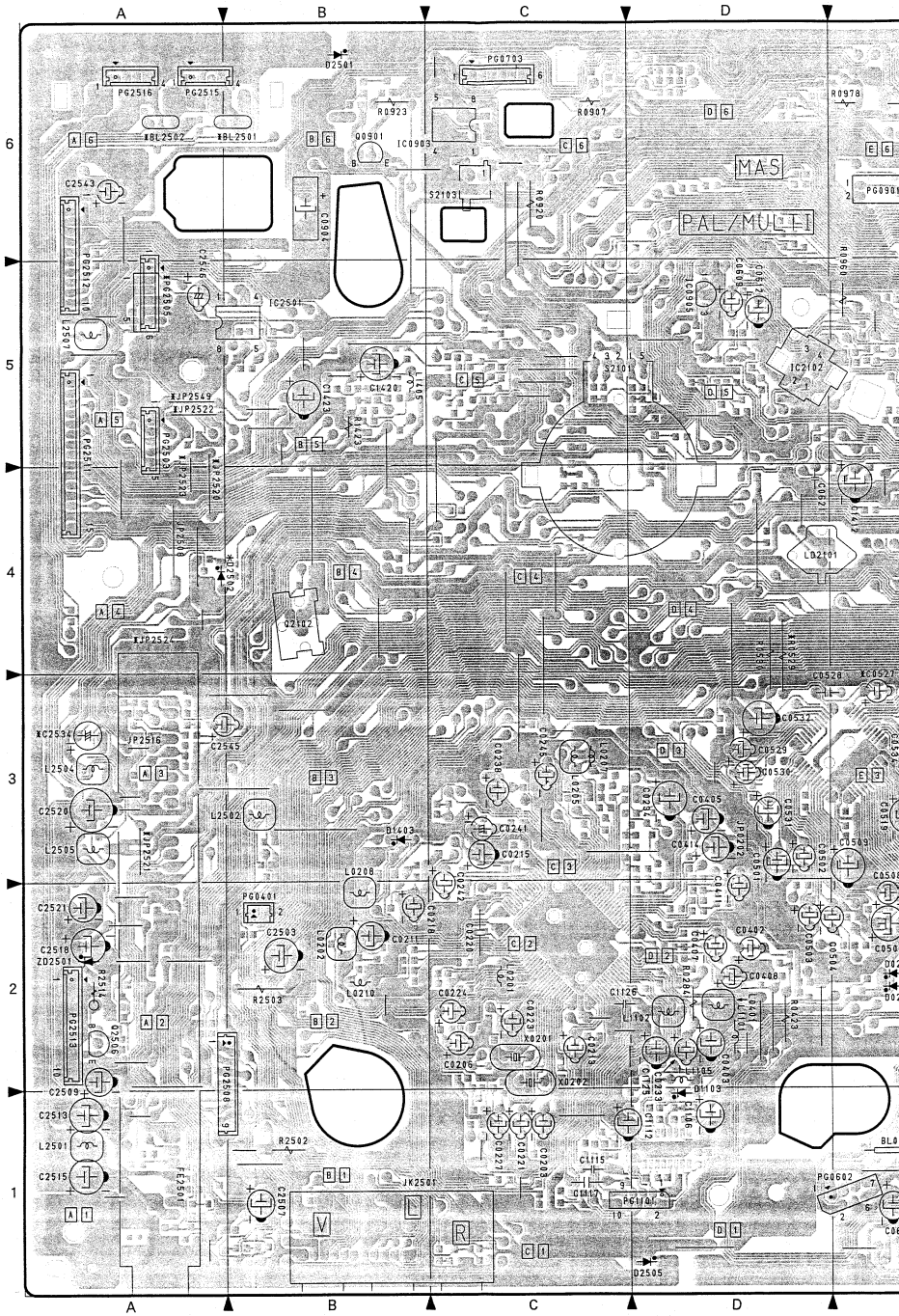
DIFFERENCE TABLE

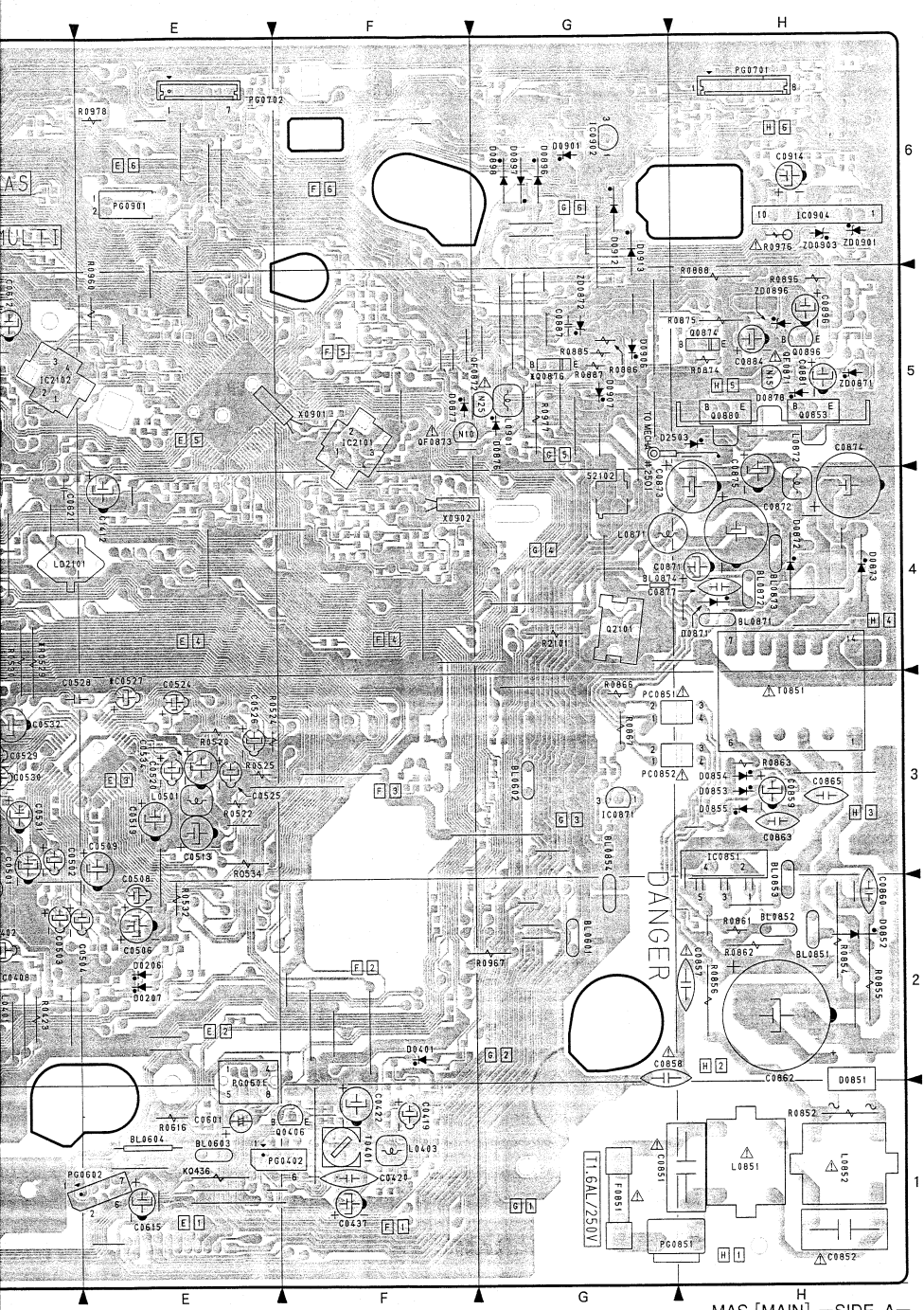
MAS [MAIN] CIRCUIT BOARD-SIDE A-

NOTE: This table listes the different components marked with asterisks (✱) in the circuit board diagrams.

SYMBOL No.	FX8000EM (GKI/HKN)	FX8000EM (JU)	FX8000E (AU)
BL2501	○	○	JUMPER
BL2502	○	○	JUMPER
C0527	○	×	○
C2534	○	JUMPER	○
D2502	○	×	○
JP2520	×	○	×
JP2521	○	×	○
JP2522	○	×	○
JP2523	○	×	○
JP2524	×	○	×
JP2549	×	○	×
PG2505	5P	6P	5P
R0529	○	×	○

MAS [MAIN] CIRCUIT BOARD –SIDE A–

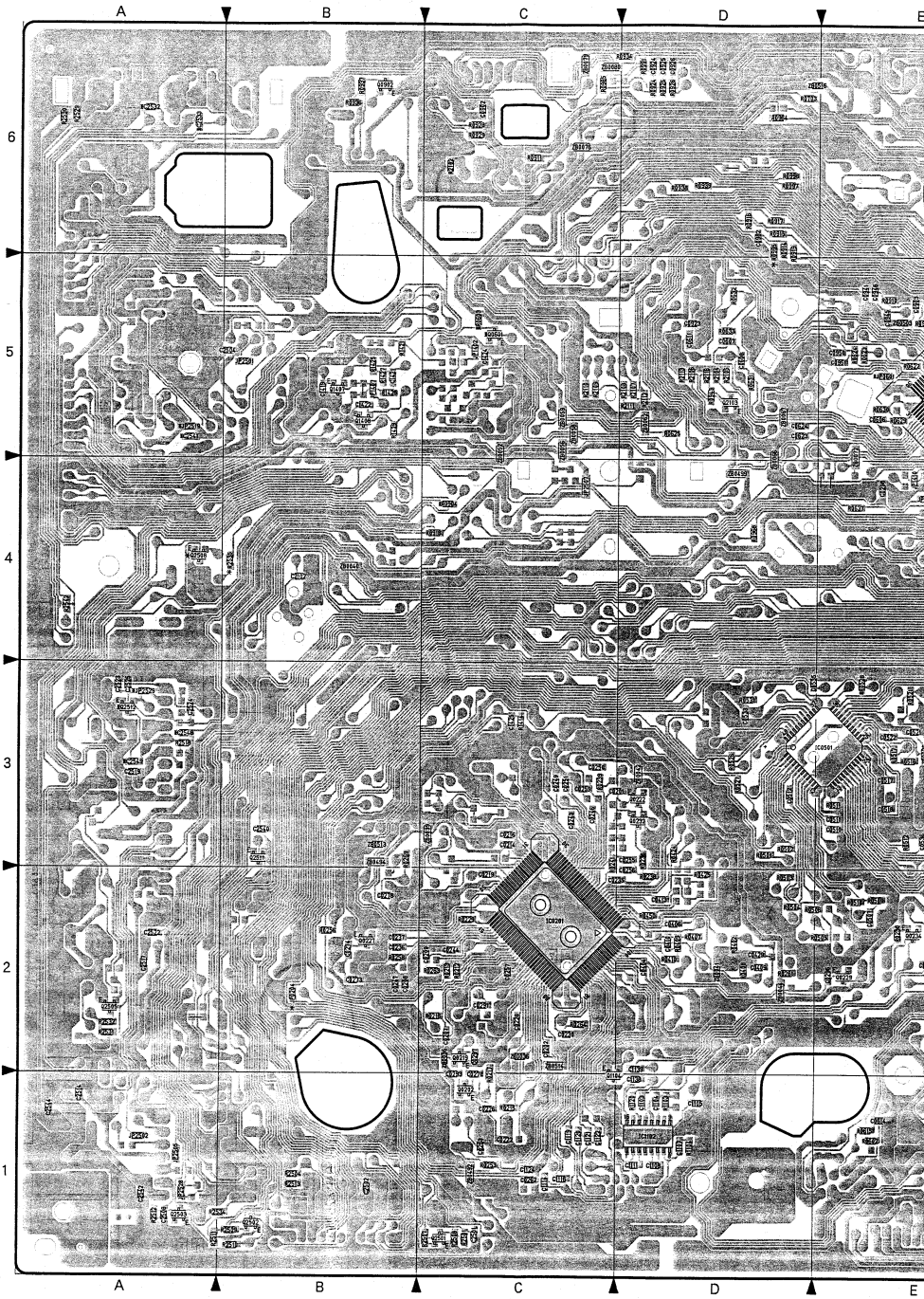


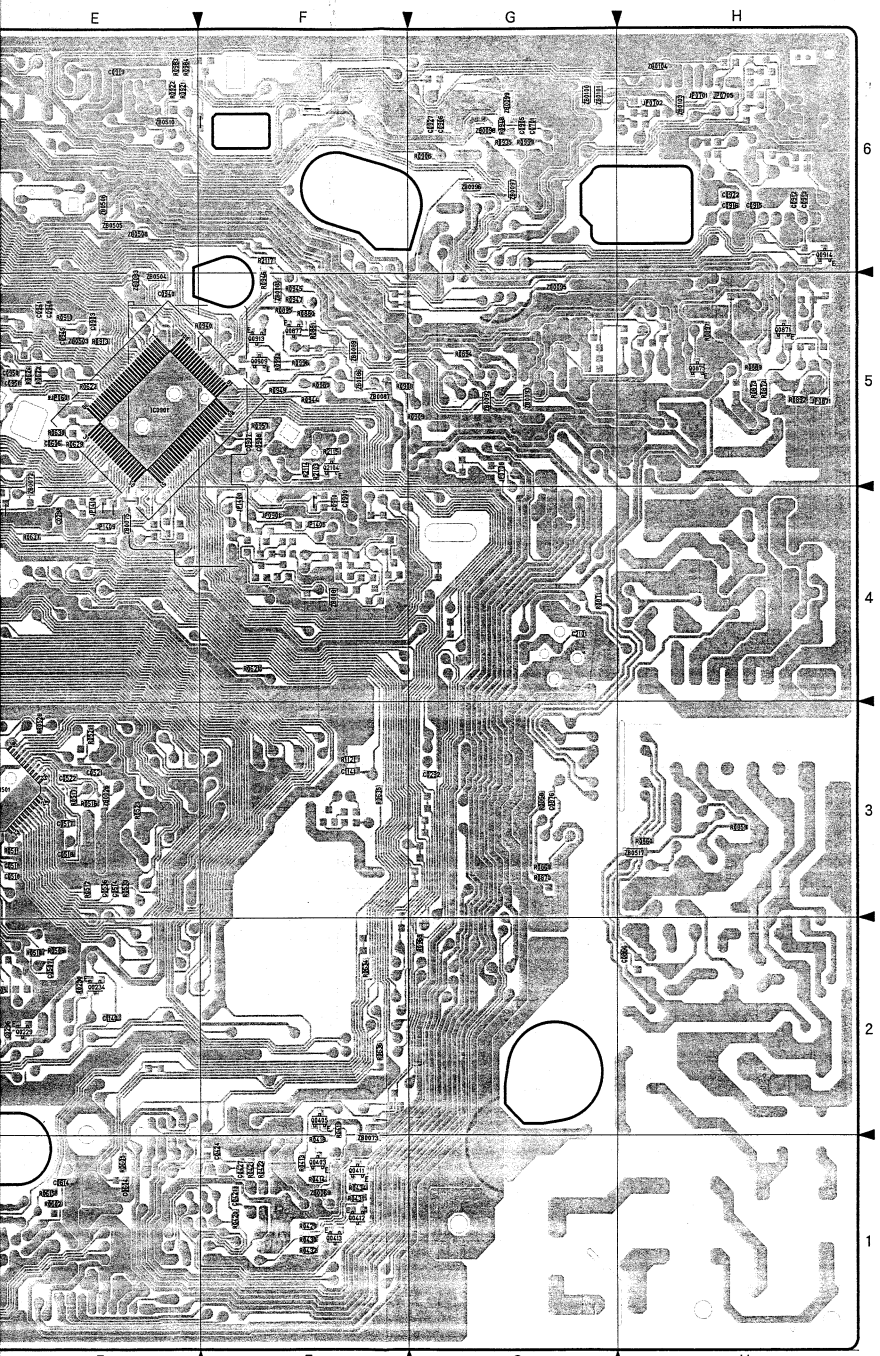


MAS [MAIN] —SIDE A—

[PATTERN No. JK1365-8]

MAS [MAIN] CIRCUIT BOARD –SIDE B–





MAS [MAIN] —SIDE B—
[PATTERN No. JK1365-8]

DIFFERENCE TABLE

MAS [MAIN] CIRCUIT BOARD-SIDE B-

NOTE: This table listes the different components marked with asterisks (*) in the circuit board diagrams.

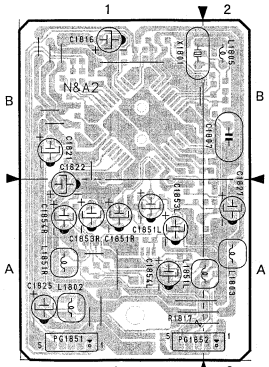
SYMBOL No.	FX8000EM (GKI/HKN)	FX8000EM (JU)	FX8000E (AU)
C2532	○	○	×
C2533	○	○	×
C2541	○	×	○
C2548	○	×	○
C2549	×	○	×
JP0204	○	○	×
JP0601	×	×	○
JP2519	×	○	×
JP2529	○	○	×
Q0501	○	○	×
Q2508	○	×	○
Q2512	×	○	×
R0528	○	×	○
R0603	○	○	×
R0904	×	○	×
R0995	○	×	○
R2535	○	×	○

IDENTIFICATION OF PARTS LOCATION

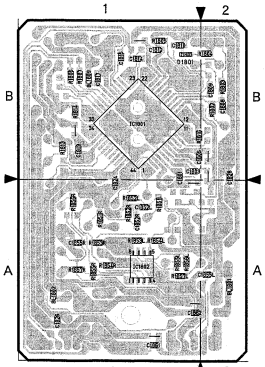
MAS [MAIN]

Symbol No.	Parts Location
#	
#2501	A-5H
BL	
BL0601	A-2G
BL0602	A-3G
BL0603	A-1E
BL0604	A-1E
BL0851	A-2H
BL0852	A-2H
BL0853	A-2H
BL0854	A-2G
BL0871	A-4H
BL0872	A-4H
BL0873	A-4H
BL0874	A-4G
BL2501	A-6B
BL2502	A-6A
C	
C0201	B-3C
C0202	B-2C
C0203	A-1C
C0206	A-2C
C0207	B-2C
C0208	B-2B
C0209	B-2C
C0211	A-2B
C0213	A-2C
C0214	B-3C
C0215	A-3C
C0216	B-3C
C0218	A-2B
C0219	B-2C
C0220	A-2C
C0221	A-1C
C0222	B-1C
C0223	A-2C
C0224	A-2C
C0226	B-1C
C0227	A-1C
C0228	B-2C
C0230	B-2C
C0233	A-2D
C0234	A-3D
C0235	B-2D
C0236	B-2B
C0237	B-2B
C0238	A-3C
C0241	A-3C
C0242	A-2C
C0243	B-3C
C0244	B-2C
C0245	A-3C
C0246	B-3C
C0247	B-2B
C0249	B-3C
C0250	B-3C
C0251	B-3C
C0255	B-3D
C0256	B-2D
C0257	B-2C
C0259	B-3C
C0262	B-1C
C0263	B-1C
C0270	B-1C
C0273	B-2B
C0274	B-2B
C0278	B-2B
C0291	B-2C
C0292	B-3G
C0293	B-1C
C0296	B-2E
C0297	B-2C
C0298	B-4E
C0402	A-2D
C0403	A-2D
C0404	B-2D
C0405	A-3D
C0406	B-2D
C0407	A-2D
C0408	A-2D
C0409	B-2D
C0410	B-2D
C0411	A-2D
C0413	B-2D
C0414	A-3D
C0419	A-1F
C0420	A-1F
C0421	B-1F
C0422	A-1F
C0424	B-1F
C0427	B-1F
C0429	B-2D
C0437	A-1F
C0501	A-3D
C0502	A-3D
C0503	A-2D
C0504	A-2E
C0506	A-2E
C0507	B-2E
C0508	A-2E
C0509	A-3E
C0510	B-3E
C0511	B-3E
C0512	B-3D
C0513	A-3E
C0514	B-3E
C0517	B-3E
C0518	B-3E
C0519	A-3E
C0520	A-3E
C0521	B-3E
C0522	B-3E
C0524	A-3E
C0525	A-3E
C0526	A-3E
C0527	A-3E
C0528	A-3D
C0529	A-3D
C0530	A-3D
C0531	A-3D
C0532	A-3D
C0533	B-3D
C0534	A-3E
C0535	B-3D
C0536	B-3E
C0601	A-1E
C0604	B-1E
C0606	B-5E
C0607	B-5D
C0608	B-5D
C0609	A-5D
C0611	B-5D
C0612	A-5D
C0614	B-1E
C0615	A-1E
C0621	A-4D
C0623	B-5D
C0624	B-5D
C0701	B-6G
C0851	A-1H
C0852	A-1H
C0857	A-2H
C0858	A-2G
C0859	A-3H
C0860	A-2H
C0862	A-2H
C0863	A-3H
C0865	A-3H
C0866	B-2H
C0871	A-4H
C0872	A-4H
C0873	A-4H
C0874	A-4H
C0875	A-4H
C0876	A-3G
C0896	A-5H
C0902	B-6C
C0903	B-5E
C0904	A-6B
C0905	B-6G
C0906	B-6G
C0907	B-5F
C0908	B-5F
C0909	B-4F
C0910	B-4F
C0912	B-6H
C0913	B-6H
C0914	A-6H
C0915	B-6H
C0916	B-6H
C0919	B-6E
C0922	B-6H
C0923	B-5D
C0924	B-6D
C0925	B-6D
C0926	B-6D
C0927	B-6G
C0940	B-5E
C0941	B-5E
C0945	B-5E
C0946	B-5E
C0950	B-5E
C0951	B-5E
C0982	B-6D
C1103	B-1D
C1104	B-1D
C1105	B-1D
C1106	A-1D
C1107	B-1D
C1108	B-1D
C1111	B-1D
C1112	A-1C
C1114	B-1C
C1115	A-1C
C1116	B-1C
C1117	A-1C
C1119	B-1C
C1120	B-1C
C1121	B-1C
C1122	B-1C
C1124	B-1C
C1125	A-2D
C1126	A-2C
C1138	B-1D
C1139	B-2D
C1140	B-2E
C1141	B-3F
C1412	A-4E
C1419	B-5B
C1420	A-5B
C1421	B-5B
C1422	B-5B
C1423	A-5B
C1424	B-5C
C1425	B-3C
C2101	B-4G
C2102	B-4B
C2501	B-1C
C2502	B-1B
C2503	A-2B
C2504	B-5B
C2507	A-1B
C2508	B-1A
C2509	A-2A
C2513	A-1A
C2514	B-1A
C2515	A-1A
C2517	B-2A
C2518	A-2A
C2519	B-3A
C2520	A-3A
C2521	A-2A
C2522	B-2A
C2523	B-3A
C2524	B-3A
C2525	B-3A
C2532	B-6A
C2533	B-6A
C2534	A-3A
C2540	B-3B
C2541	B-5A
C2542	B-1A
C2543	A-6A
C2544	B-1A
C2545	A-3A
C2546	A-5A
C2548	B-3A
C2549	B-3A
D	
D0206	A-2E
D0207	A-2E
D0401	A-2F
D0851	A-2H
D0852	A-2H
D0853	A-3H
D0854	A-3H
D0855	A-3H
D0871	A-4H
D0872	A-4H
D0873	A-4H
D0876	A-5G
D0877	A-5F
D0878	A-5H
D0896	A-6G
D0897	A-6G
D0898	A-6G
D0901	A-6G
D0906	A-5G
D0907	A-5G
D0912	A-6G
D0913	A-6G
D1103	A-1D
D1403	A-3B
D2501	A-6B
D2502	A-4A
D2503	A-5H
D2505	A-1D
F	
F0851	A-1G
FE	
FE2501	A-1A
IC	
IC0201	B-2C
IC0501	B-3E
IC0851	A-2H
IC0871	A-3G
IC0901	B-5E
IC0902	A-6G
IC0903	A-6C
IC0904	A-6H
IC0905	A-5D
IC1102	B-1D
IC2101	A-5F
IC2102	A-5D
IC2501	A-5B
JK	
JK2501	A-1B
JP	
JP0204	B-2B
JP0601	B-5E
JP2519	B-5A
JP2520	A-4A
JP2521	A-3A
JP2522	A-5A
JP2523	A-4A
JP2524	A-4A
JP2529	B-3A
JP2549	A-5A
K	
K0436	A-1E
L	
L0201	A-2C
L0202	A-2B
L0205	A-3C
L0207	A-3C
L0208	A-2B
L0210	A-2B
L0401	A-2D
L0403	A-1F
L0501	A-3E
L0851	A-1H
L0852	A-1H
L0871	A-4G
L0872	A-4H
L0901	A-5G
L1101	A-2D
L1102	A-2D
L1105	A-2D
L1405	A-5B
L2501	A-1A
L2502	A-3B
L2504	A-3A
L2505	A-3A
L2507	A-5A
LD	
LD2101	A-4D
PC	
PC0851	A-3H
PC0852	A-3H
PG	
PG0401	A-2B
PG0402	A-1E
PG0601	A-2E
PG0602	A-1E
PG0701	A-6H
PG0702	A-6E
PG0703	A-6C
PG0851	A-1G
PG0901	A-6E
PG1101	A-1D
PG2503	A-5A
PG2505	A-5A
PG2508	A-2B
PG2511	A-5A
PG2512	A-6A
PG2513	A-2A
PG2515	A-6A
PG2516	A-6A
Q	
Q0202	B-1C
Q0219	B-2C
Q0222	B-3D
Q0227	B-2B
Q0229	B-2E
Q0232	B-3D
Q0234	B-2E
Q0403	B-1F
Q0405	B-2F
Q0406	A-1F
Q0411	B-1F
Q0412	B-1F
Q0413	B-1F
Q0601	B-5C
Q0853	A-5H
Q0871	B-5H
Q0874	A-5H
Q0875	B-5H
Q0876	A-5G
Q0877	B-5F
Q0880	A-5H
Q0896	A-5H
Q0901	A-6B
Q0902	B-6B
Q0909	B-5F
Q0913	B-5F
Q0914	B-6H
Q1104	B-1C
Q1407	B-5B
Q1408	B-5B
Q2101	A-4G
Q2102	A-4B
Q2103	B-5D
Q2104	B-5F
Q2501	B-1C
Q2502	B-1B
Q2503	B-1A
Q2505	B-2A
Q2506	A-2A
Q2508	B-4A
Q2511	B-3B
Q2512	B-3A
QF	
QF0671	A-5H
QF0672	A-5G
QF0673	A-5F
R	
R0212	B-2C
R0213	B-2C
R0215	B-1C
R0216	B-2C
R0217	B-1C
R0229	B-2C
R0230	B-2E
R0236	B-3D
R0238	B-2D
R0239	B-3C
R0241	B-3C
R0253	B-1C
R0256	B-2B
R0258	B-2B
R0261	B-2D
R0263	B-2C
R0264	B-2C
R0269	B-3B
R0284	A-2D
R0402	B-2D
R0407	B-2D
R0408	B-2D
R0409	B-2D
R0410	B-2D
R0413	B-1F
R0414	B-1F
R0418	B-1F
R0419	B-2F
R0420	B-1F
R0421	B-1F
R0422	B-1F
R0423	A-2D
R0424	B-3D
R0425	B-2D
R0429	B-1F
R0430	B-1F
R0431	B-1F
R0432	B-1F
R0434	B-1F
R0450	B-2D
R0501	B-3D
R0502	B-3D
R0503	B-2D
R0504	B-2D
R0505	B-2E
R0506	B-2D
R0509	B-2E
R0510	B-2E
R0511	B-3E
R0512	B-3E
R0516	B-3E
R0517	B-3E
R0520	A-3E
R0521	B-3E
R0522	A-3E
R0523	B-3E
R0524	A-3E
R0525	A-3E
R0526	B-3D
R0527	B-3D
R0528	B-3E
R0529	A-4D
R0530	A-4D
R0531	B-3D
R0532	A-2E
R0533	B-3E
R0534	A-3E
R0602	B-1E
R0603	B-5C
R0605	B-1E
R0615	B-1E
R0616	A-1E
R0621	B-4F
R0622	B-5E
R0623	B-5E
R0624	B-5E
R0625	B-5D
R0629	B-5E
R0630	B-5E
R0631	B-5D
R0632	B-5D
R0633	B-5D
R0634	B-2F
R0635	B-3F
R0636	B-2F
R0637	B-4E
R0703	B-6D
R0852	A-1H
R0854	A-2H
R0855	A-2H
R0856	A-2H
R0859	B-3H
R0860	B-3H
R0861	A-2H
R0862	A-2H
R0863	A-3H
R0866	A-3G
R0867	A-3G
R0868	B-3G
R0869	B-3G
R0870	B-3G
R0871	B-4G
R0872	B-5H
R0873	B-5H
R0874	A-5H
R0875	A-5H
R0880	B-5F
R0881	B-5F
R0885	A-5G
R0886	A-5G
R0887	A-5G
R0888	A-5H
R0889	B-5H
R0892	B-5H
R0894	B-5G
R0895	B-5F
R0896	A-5H
R0897	B-5H
R0904	B-4C
R0908	B-6G
R0907	A-6C
R0908	B-5F
R0909	B-5G
R0910	B-5E
R0911	B-6C
R0913	B-5E
R0914	B-6D
R0915	B-6D
R0916	B-6D
R0917	B-6D
R0918	B-4C
R0919	B-6D
R0920	A-6C
R0921	B-6E
R0922	B-6E
R0923	A-6B
R0924	B-6D
R0925	B-6D
R0926	B-6D
R0928	B-6C
R0929	B-6C
R0934	B-6D
R0935	B-6G
R0936	B-6B
R0937	B-6B
R0938	B-6D
R0939	B-6D
R0940	B-5F
R0943	B-5D
R0944	B-5F
R0945	B-5F
R0946	B-5F
R0947	B-5F
R0948	B-6G
R0949	B-5F
R0957	B-5F
R0960	A-5E
R0964	B-6D
R0965	B-2G
R0967	A-2G
R0968	B-4D
R0976	A-6H
R0977	A-5G
R0978	A-6E
R0983	B-6E
R0984	B-6E
R0985	B-6C
R0989	B-5F
R0991	B-6D
R0993	B-5F
R0995	B-6D
R0996	B-5F
R0997	B-6D
R0998	B-6D
R0999	B-6G
R1103	B-1D
R1104	B-1D
R1120	B-1D
R1121	B-3F
R1414	B-3C
R1421	B-5B
R1423	A-5B
R1425	B-5B
R1427	B-5B
R1428	B-5B
R1429	B-5B
R2101	A-4G
R2102	B-6C
R2103	B-5F
R2104	B-5D
R2105	B-5D
R2106	B-5D
R2107	B-5D
R2108	B-5D
R2109	B-5C
R2110	B-5C
R2111	B-5D
R2112	B-5D
R2113	B-5D
R2114	B-5F
R2115	B-5F
R2116	B-5D
R2117	B-6F
R2501	B-1C
R2502	A-1B
R2503	A-2B
R2504	B-1B
R2507	B-1C
R2508	B-1C
R2509	B-1B
R2510	B-1B
R2511	B-1A
R2512	B-1A
R2513	B-1B
R2514	A-2A
R2518	B-3A
R2529	B-6A
R2530	B-6A
R2531	B-2A
R2532	B-2A
R2534	B-1B
R2535	B-4B
R2542	B-4A
S	
S2101	A-5C
S2102	A-4G
S2103	A-6C
T	
T0401	A-1F
T0851	A-3H
X	
X0201	A-2C
X0202	A-2C
X0901	A-5F
X0902	A-4F
ZD	
ZD0671	A-5H
ZD0872	A-5G
ZD0896	A-5H
ZD0901	A-6H
ZD0903	A-6H
ZD2501	A-2A

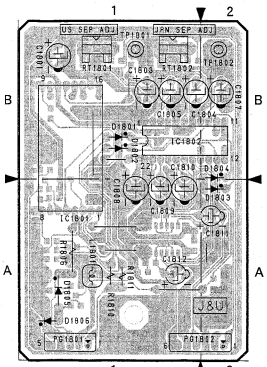
N&A, J&U, A2 CIRCUIT BOARDS



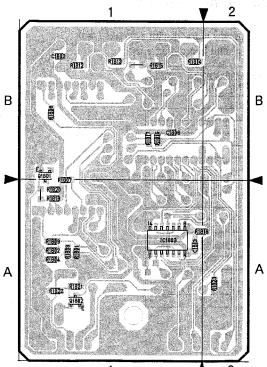
N&A [NICAM] —SIDE A—



N&A [NICAM] —SIDE B—
[PATTERN No. JK1360-3]
[FOR (GKI)NA,HKN]



J&U [MPX AUDIO] —SIDE A—



J&U [MPX AUDIO] —SIDE B—
[PATTERN No. JK1404-1]
[FOR (JU)]

IDENTIFICATION OF PARTS LOCATION

N&A

Symbol No.	Parts Location
BL	
BL1801	B-2A
BL1802	B-1A
BL1809	B-1B
C	
C1801	B-1B
C1803	B-1B
C1805	B-1B
C1807	A-2B
C1808	B-2B
C1809	B-2B
C1810	B-1B
C1812	B-1B
C1814	B-1B
C1815	B-1B
C1816	A-1B
C1817	B-1B
C1819	B-1B
C1821	A-1B
C1822	A-1A
C1824	B-1A
C1825	A-1A
C1826	B-1A
C1827	A-2A
C1828	B-2B
C1851L	A-1A

Symbol No.	Parts Location
C1851R	A-1A
C1852L	B-1A
C1852R	B-1A
C1853L	A-1A
C1853R	A-1A
C1854L	A-1A
C1854R	A-1A
C1855L	B-2A
C1855R	B-1A
C1861	B-1A
C1862	B-1A
D	
D1801	B-1B
IC	
IC1801	B-1B
L	
L1802	A-1A
L1803	A-2A
L1805	A-2B
L1851L	A-2A
L1851R	A-1A
PG	
PG1851	A-1A
PG1852	A-1A
R	
R1802	B-2B

Symbol No.	Parts Location
R1803	B-2B
R1804	B-2B
R1805	B-1B
R1806	B-1B
R1807	B-1B
R1813	B-1B
R1814	B-1B
R1816	B-1B
R1817	A-1A
R1851L	B-1A
R1851R	B-1A
R1852L	B-1A
R1852R	B-1A
R1853L	B-1A
R1853R	B-1A
R1854L	B-1A
R1854R	B-1A
R1855L	B-1A
R1855R	B-1A
R1856L	B-1A
R1856R	B-1A
R1857L	B-1A
R1857R	B-1A
X	
X1601	A-1B

J&U

Symbol No.	Parts Location
C	
C1601	A-1B
C1602	B-1B
C1603	A-1B
C1604	A-1B
C1605	A-1B
C1606	B-1B
C1607	A-2B
C1608	A-1A
C1609	A-1A
C1610	A-1A
C1611	A-2A
C1612	A-1A
C1613	B-1A
D	
D1801	A-1B
D1802	A-1B
D1803	A-2A
D1804	A-2B
D1805	A-1A
D1806	A-1A
IC	
IC1801	A-1B
IC1802	A-1B
IC1803	B-1A
L	

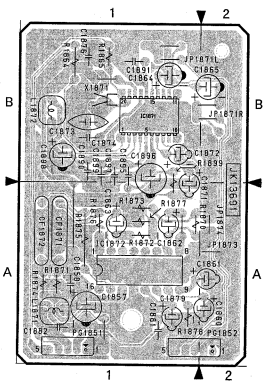
Symbol No.	Parts Location
L1801	A-1A
PG	
PG1801	A-1A
PG1802	A-1A
Q	
Q1601	B-1B
Q1602	B-1A
R	
R1801	B-1A
R1802	B-1A
R1803	B-1A
R1804	B-1A
R1806	A-1A
R1807	B-1A
R1808	B-1B
R1809	B-1A
R1810	A-1A
R1811	A-1A
R1812	B-1B
R1813	B-1B
R1814	B-1B
R1815	B-1B
R1816	B-1B
R1817	B-1B
R1818	B-1A
R1819	B-1A

Symbol No.	Parts Location
R1820	B-1A
R1821	B-1A
R1822	B-1A
R1823	B-2A
RT	
RT1801	A-1B
RT1802	A-1B
TP	
TP1801	A-1B
TP1802	A-2B

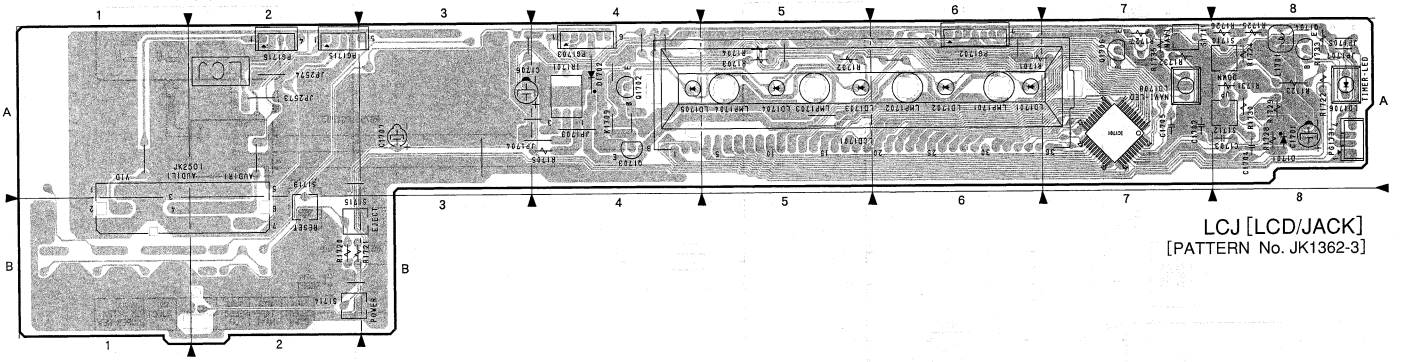
A2

Symbol No.	Parts Location
C	
C1857	1A
C1858	1A
C1860	2A
C1861	2A
C1862	1A
C1863	1A
C1864	1B
C1865	2B
C1871	1A
C1872	1B
C1873	1B
C1874	1B
C1876	1B
C1879	1A
C1881	1A
C1882	1A
C1890	1B
C1891	1B
C1895	1B
C1896	1B
C1897	1B
C1898	1B
C1899	1B
CF	
CF1871	1A

Symbol No.	Parts Location
CF1872	1A
IC	
IC1871	1B
IC1872	1A
L	
L1871	1A
L1872	1B
PG	
PG1851	1A
PG1852	1A
R	
R1864	1B
R1865	1B
R1870	1A
R1871	1A
R1872	1A
R1873	1A
R1874	1A
R1875	1A
R1876	1A
R1877	1A
R1878	1A
R1899	1A
X	
X1671	1B



A2 [A2]
[PATTERN No. JK1369-2]
[FOR AU]



LCJ [LCD/JACK]
[PATTERN No. JK1362-3]

IDENTIFICATION OF PARTS LOCATION

LCJ

Symbol No.	Parts Location
C	
C1701	8A
C1702	7A
C1703	8A
C1704	8A
C1705	7A
C1706	3A
C1707	3A
D	
D1701	8A
D1702	4A
IC	
IC1701	7A
IR	
IR1701	4A
JK	
JK2501	1B
L	
L1701	8A
LCD	
LCD1701	5A
LD	
LD1701	6A
LD1702	6A
LD1703	5A
LD1704	5A

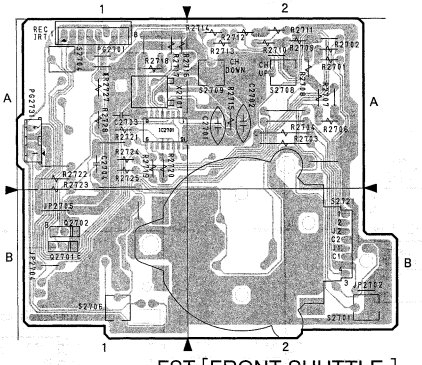
Symbol No.	Parts Location
LD1705	4A
LD1706	8A
LD1708	7A
LMP	
LMP1701	6A
LMP1702	6A
LMP1703	5A
LMP1704	5A
PG	
PG1702	6A
PG1703	4A
PG1715	2A
PG1716	2A
PG1731	8A
Q	
Q1702	4A
Q1703	4A
Q1704	8A
Q1706	7A
R	
R1701	6A
R1702	5A
R1703	5A
R1704	5A
R1705	4A
R1720	2B

Symbol No.	Parts Location
R1721	2B
R1722	8A
R1723	8A
R1724	8A
R1725	8A
R1726	8A
R1727	7A
R1728	8A
R1729	8A
R1730	8A
R1731	8A
R1732	7A
R1733	8A
R1735	7A
S	
S1710	8A
S1711	7A
S1712	8A
S1714	2B
S1715	2B
S1719	2B

FST

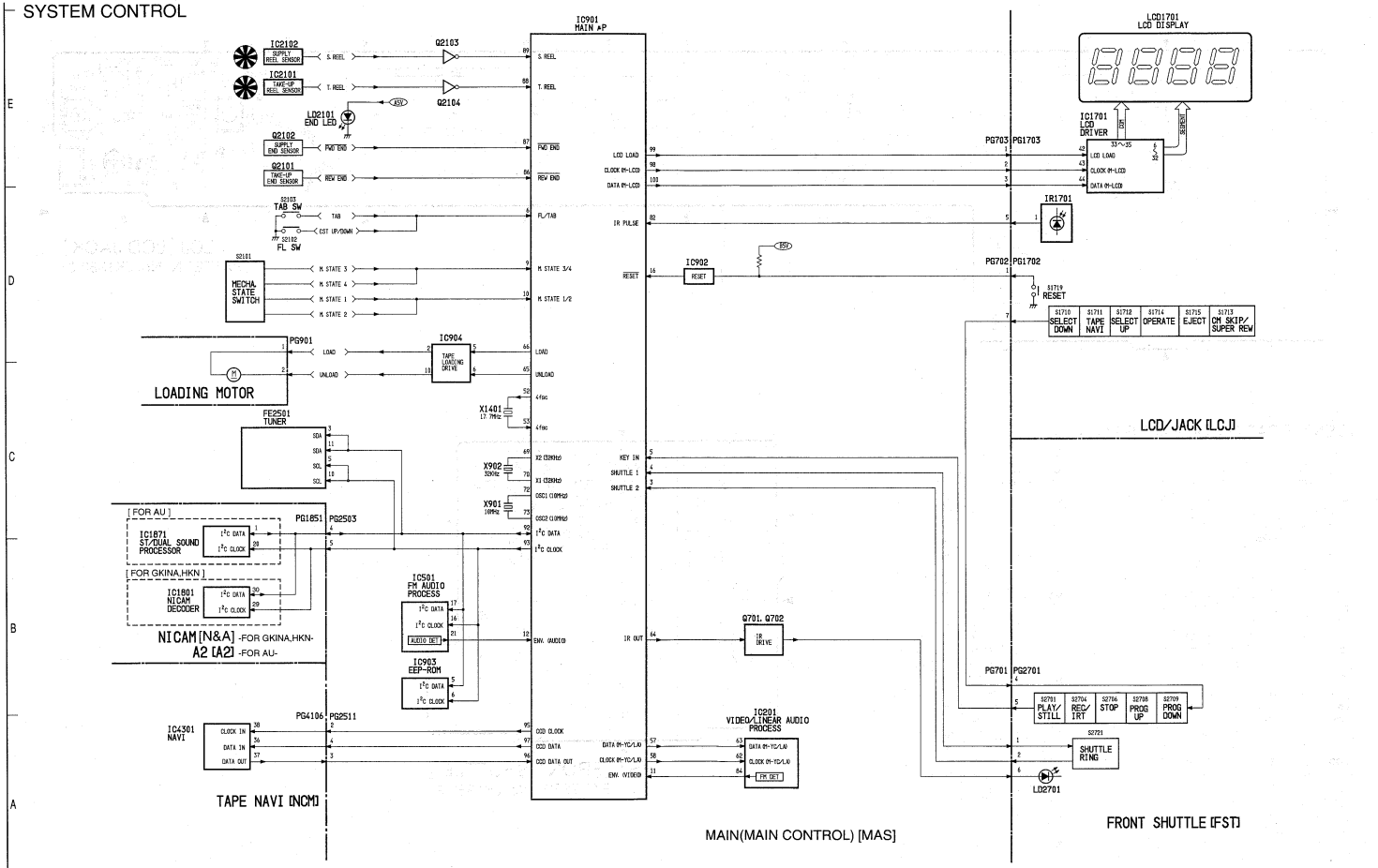
Symbol No.	Parts Location
C	
C2701	2A
C2702	2A
C2703	1A
C2704	1A
IC	
IC2701	1A
PG	
PG2701	1A
PG2731	1A
Q	
Q2701	1B
Q2702	1B
R	
R2701	2A
R2702	2A
R2703	2A
R2704	2A
R2706	2A
R2707	2A
R2708	2A
R2709	2A
R2710	2A
R2711	2A
R2712	2A
R2713	2A

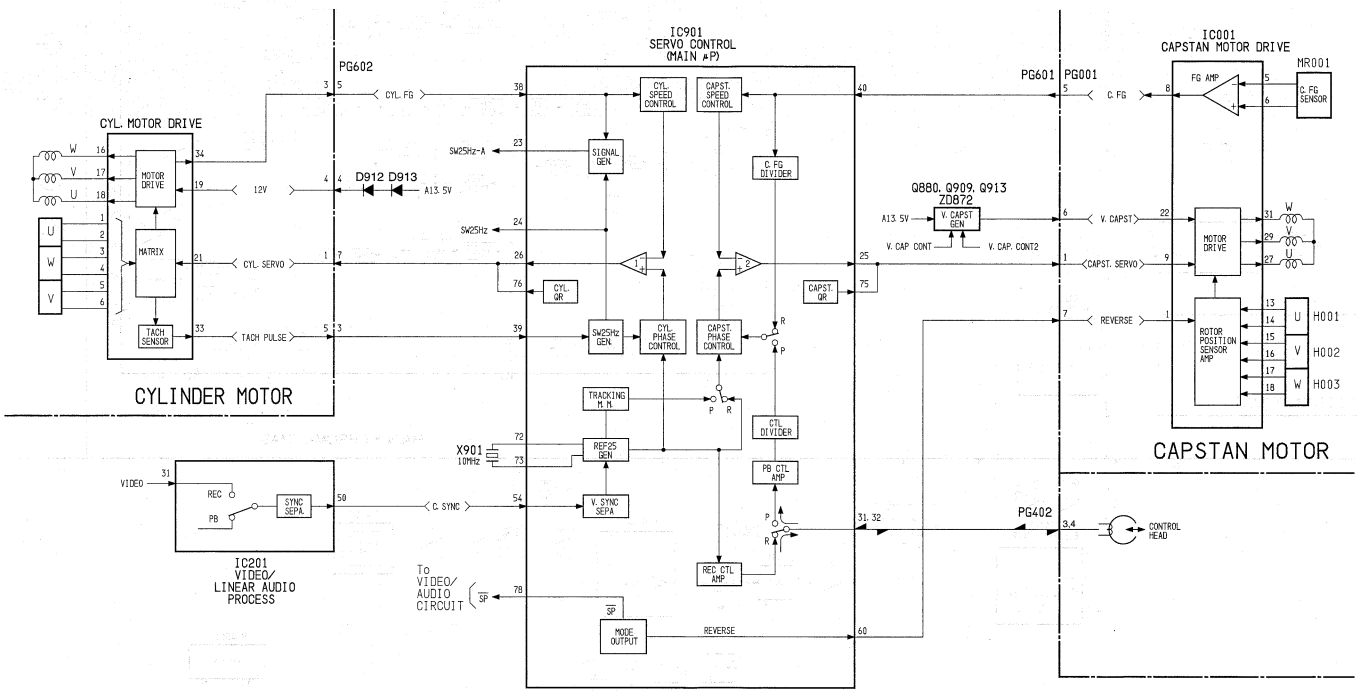
Symbol No.	Parts Location
R2714	2A
R2715	2A
R2716	1A
R2717	1A
R2718	1A
R2719	1A
R2720	1A
R2721	1A
R2722	1A
R2723	1A
R2724	1A
R2725	1A
R2727	1A
R2728	1A
S	
S2701	3B
S2704	1A
S2706	1B
S2708	2A
S2709	2A
S2721	2B
X	
X2701	1A

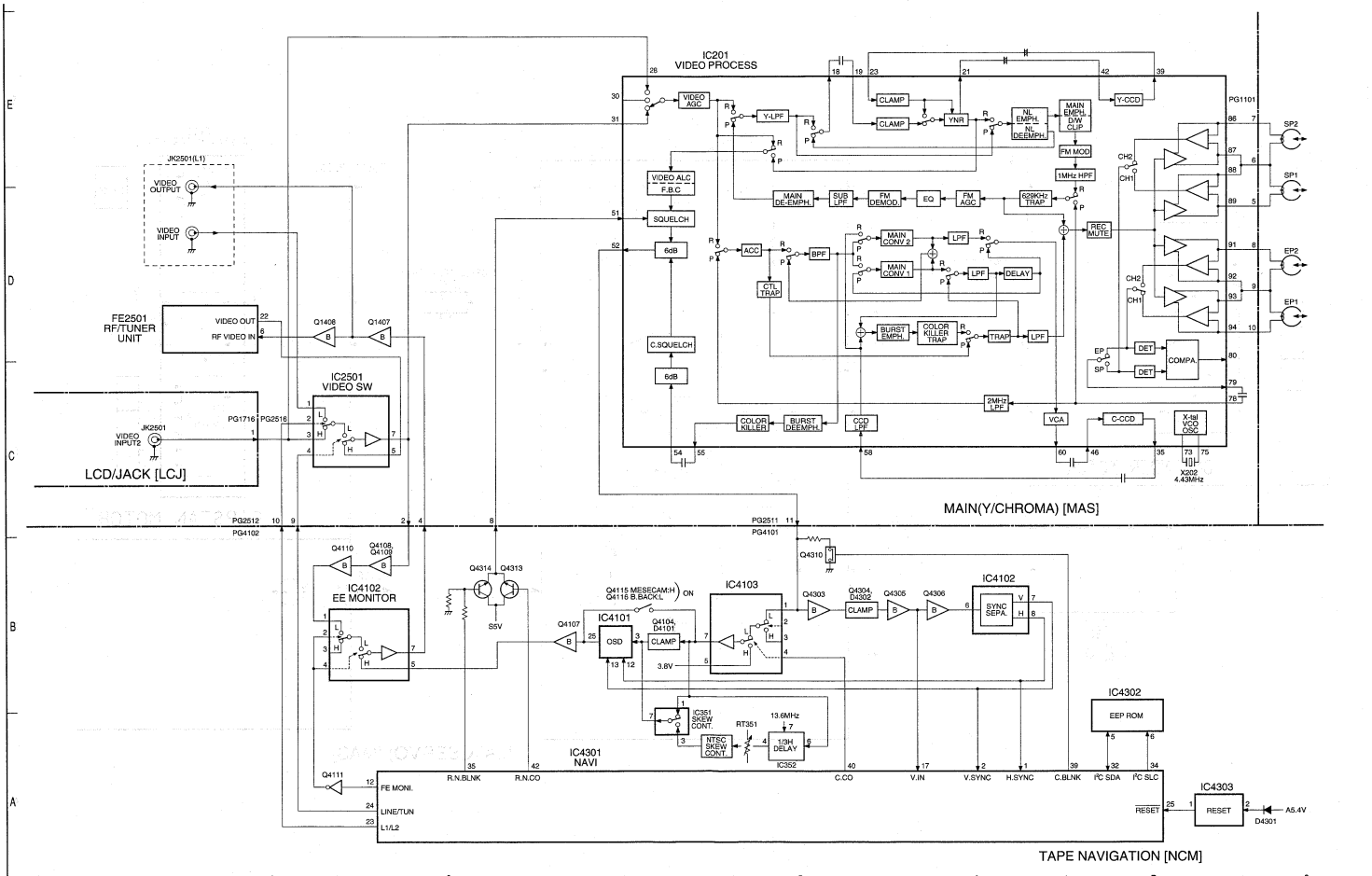


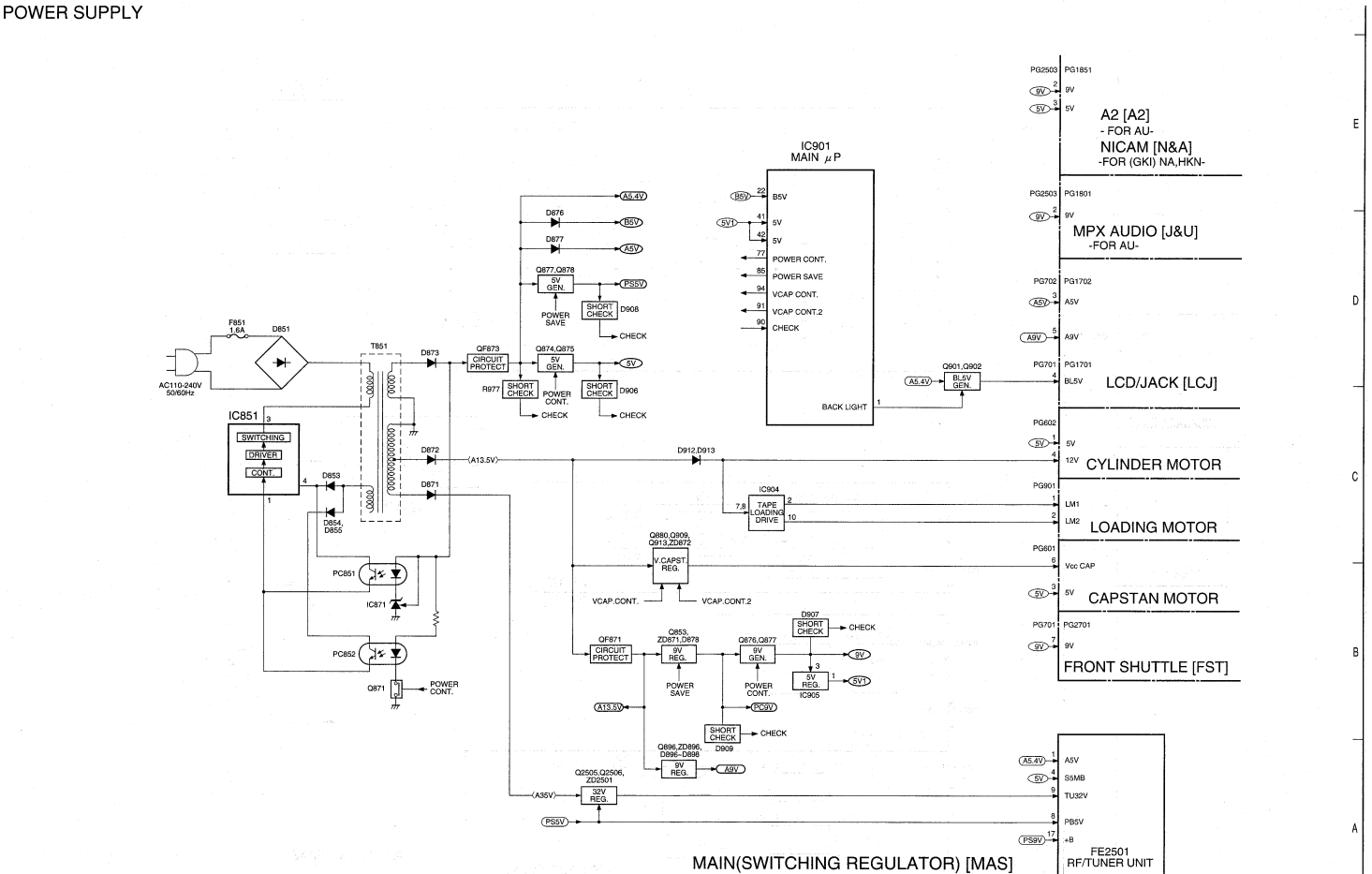
FST [FRONT SHUTTLE]
[PATTERN No. JK1362-3]

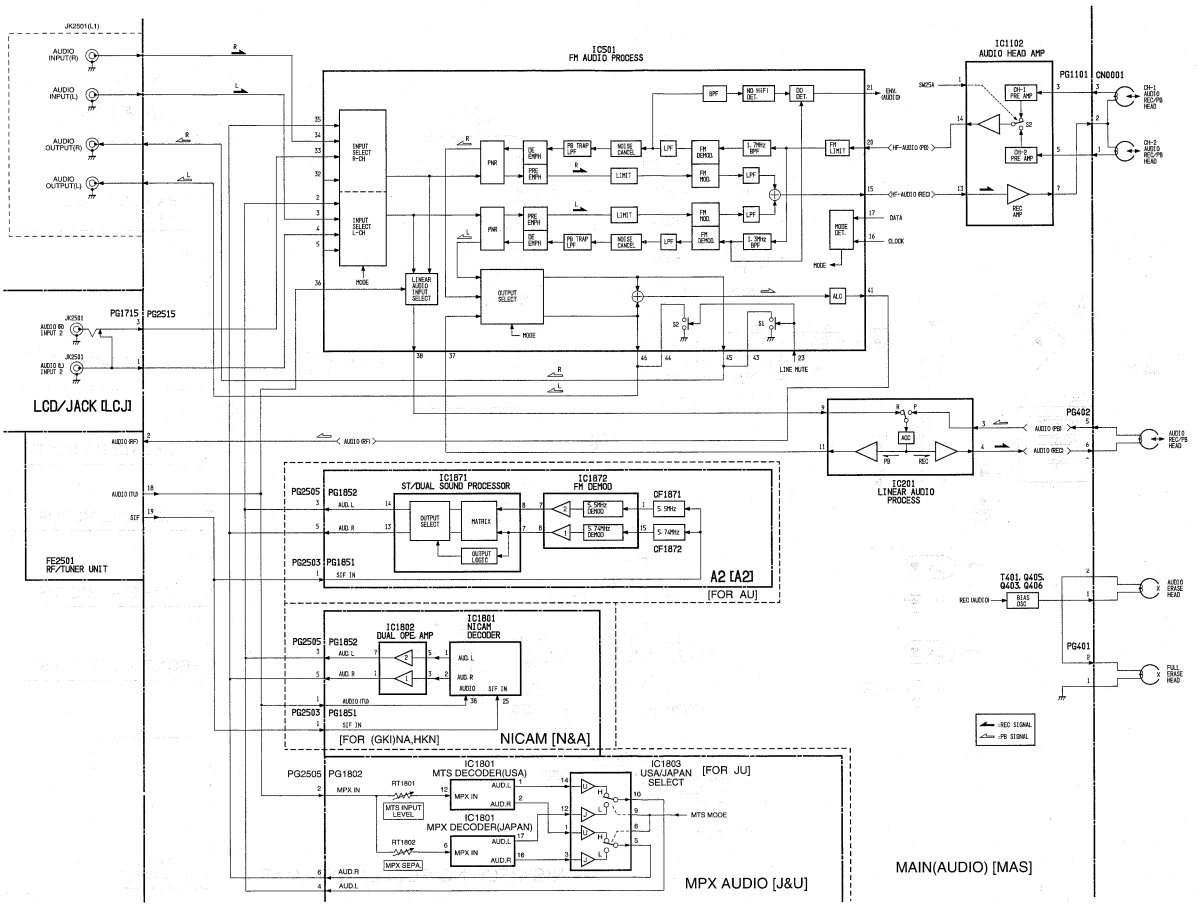
BLOCK DIAGRAM
SYSTEM CONTROL




IC901
SERVO CONTROL
(MAIN μP)
IC001
CAPSTAN MOTOR DRIVE
PG602
PG601
PG001
PG402
CYL. MOTOR DRIVE
CYLINDER MOTOR
CAPSTAN MOTOR
MAIN(SERVO) [MAS]
CYL. FG
12V
D912 D913
A13.5V
CYL. SERVO
TACH PULSE
SW25Hz-A
SW25Hz
C. FG
V. CAPST
CAPST. SERVO
REVERSE
Q880, Q909, Q913
ZD872
V. CAPST GEN
V. CAP CONT
V. CAP. CONT2
MOTOR DRIVE
MATRIX
TACH SENSOR
FG AMP
C. FG SENSOR
MR001
ROTOR POSITION SENSOR AMP
H001
H002
H003
CYL. SPEED CONTROL
CAPST. SPEED CONTROL
SIGNAL GEN
C. FG DIVIDER
CYL. QR
CAPST. QR
SW25Hz GEN.
CYL. PHASE CONTROL
CAPST. PHASE CONTROL
TRACKING M. M.
CTL DIVIDER
REF25 GEN.
PB CTL AMP
V. SYNC SEPA.
REC CTL AMP
MODE OUTPUT
X901
10MHz
VIDEO
REC
PB
SYNC SEPA.
C. SYNC
IC201
VIDEO/
LINEAR AUDIO
PROCESS
To
VIDEO/
AUDIO
CIRCUIT
CONTROL HEAD


IC201
VIDEO PROCESS
VIDEO AGC
Y-LPF
CLAMP
YNR
NL EMPH. NL DEEMPH.
MAIN EMPH. DYN CLIP
Y-CCD
FM MOD
1MHz HPF
VIDEO ALC F.B.C
SQUELCH
6dB
MAIN DE-EMPH.
SUB LPF
FM DEMOD.
EQ
FM AGC
629KHz TRAP
REC MUTE
ACC
BPF
MAIN CONV 2
MAIN CONV 1
LPF
DELAY
CTL TRAP
BURST EMPH.
COLOR KILLER TRAP
TRAP
C.SQUELCH
2MHz LPF
COLOR KILLER
BURST DEEMPH.
CCD LPF
VCA
C-CCD
X-tal VCC OSC
X202 4.43MHz
DET
COMPA.
PG1101
SP2
SP1
EP2
EP1
CH2
CH1
JK2501(L1)
VIDEO OUTPUT
VIDEO INPUT
FE2501 RF/TUNER UNIT
VIDEO OUT
RF VIDEO IN
Q1408
Q1407
IC2501
VIDEO SW
JK2501
VIDEO INPUT2
PG1716
PG2516
LCD/JACK [LCJ]
MAIN(Y/CHROMA) [MAS]
PG2512
PG4102
PG2511
PG4101
Q4310
IC4102
EE MONITOR
Q4110
Q4108, Q4109
Q4314
Q4313
5V
IC4103
Q4115 MESECAM:H
Q4116 B.BACK:L
ON
Q4303
Q4304, D4302
CLAMP
Q4305
Q4306
IC4102
SYNC SEPA.
Q4107
IC4101
OSD
Q4104, D4101
CLAMP
3.8V
IC351 SKEW CONT.
NTSC SKEW CONT.
RT351
13.6MHz
1/3H DELAY
IC352
IC4302
EEP ROM
IC4303
RESET
A5.4V
D4301
IC4301
NAVI
Q4111
FE MONI.
LINE/TUN
L1/L2
R.N.BLNK
R.N.CO
C.CO
V.IN
V.SYNC
H.SYNC
C.BLNK
I²C SDA
I²C SLC
TAPE NAVIGATION [NCM]


IC901
MAIN μP
B5V
5V
5V
POWER CONT.
POWER SAVE
VCAP CONT.
VCAP CONT.2
CHECK
BACK LIGHT
A2 [A2]
- FOR AU-
NICAM [N&A]
-FOR (GKI) NA,HKN-
MPX AUDIO [J&U]
-FOR AU-
LCD/JACK [LCJ]
CYLINDER MOTOR
LOADING MOTOR
CAPSTAN MOTOR
FRONT SHUTTLE [FST]
FE2501
RF/TUNER UNIT
MAIN(SWITCHING REGULATOR) [MAS]
AC110-240V
50/60Hz
F851
1.6A
D851
T851
IC851
SWITCHING
DRIVER
CONT.
D853
D854,
D855
D673
QF873
CIRCUIT
PROTECT
R977
D876
D877
Q877,Q878
5V
GEN.
POWER
SAVE
SHORT
CHECK
D908
CHECK
Q874,Q875
POWER
CONT.
D906
D672
D671
A13.5V
D912,D913
IC904
TAPE
LOADING
DRIVE
Q880,Q909,
Q913,ZD872
V.CAPST
REG.
VCAP.CONT.
VCAP.CONT.2
PC851
IC871
PC852
Q871
POWER
CONT.
QF871
CIRCUIT
PROTECT
Q853,
ZD871,D878
9V
REG.
POWER
SAVE
Q876,Q877
9V
GEN.
POWER
CONT.
D907
SHORT
CHECK
CHECK
9V
5V
REG.
IC905
5V1
PC9V
A13.5V
SHORT
CHECK
D909
CHECK
Q896,ZD896,
D896-D898
9V
REG.
A9V
Q2505,Q2506,
ZD2501
32V
REG.
A35V
PS5V
Q901,Q902
BL5V
GEN.
A5.4V
PG2503
PG1851
9V
5V
PG2503
PG1801
9V
PG702
PG1702
A5V
A9V
PG701
PG1701
BL5V
PG602
5V
12V
PG901
LM1
LM2
PG601
Vcc CAP
5V
PG701
PG2701
9V
A5.4V
A5V
5V
S5MB
TU32V
PB5V
PS9V
+B


IC501
FM AUDIO PROCESS
IC1102
AUDIO HEAD AMP
PG1101 CN0001
JK2501(L1)
AUDIO INPUT(R)
AUDIO INPUT(L)
AUDIO OUTPUT(R)
AUDIO OUTPUT(L)
INPUT SELECT R-CH
INPUT SELECT L-CH
MODE
LINEAR AUDIO INPUT SELECT
OUTPUT SELECT
PRE EMPH
DE EMPH
PB TRAP LPF
NOISE CANCEL
LPF
FM DEMOD
FM MOD
5.7MHz BPF
7.5MHz BPF
LIMIT
BPF
NO INPUT DET.
SD DET.
FM LIMIT
MODE DET.
ALC
S1
S2
LINE MUTE
ANA. MUDED
HF-AUDIO (PB)
HF-AUDIO (REC)
DATA
CLOCK
SW25A
CH-1 PRE AMP
CH-2 PRE AMP
REC AMP
CH-1 AUDIO REC/PB HEAD
CH-2 AUDIO REC/PB HEAD
PG1715
PG2515
JK2501
AUDIO R INPUT 2
AUDIO L INPUT 2
LCD/JACK [LCJ]
AUDIO (REF)
AUDIO ITU
SIF
FE2501
RF/TUNER UNIT
IC201
LINEAR AUDIO PROCESS
PG402
AUDIO (PB)
AUDIO (REC)
AUDIO REC/PB HEAD
IC1871
ST/DUAL SOUND PROCESSOR
IC1872
FM DEMOD
CF1871
CF1872
5.5MHz DEMOD
5.74MHz DEMOD
5.5MHz
5.74MHz
PG2505
PG1852
PG2503
PG1851
AUD L
AUD R
SIF IN
A2 [A2]
[FOR AU]
IC1802
DUAL OPE AMP
IC1801
NICAM DECODER
AUDIO
[FOR (GKI)NA,HKN]
NICAM [N&A]
T401 Q405 Q403 Q406
REC (AUDIO)
BIAS OSC
AUDIO ERASE HEAD
PG401
FULL ERASE HEAD
:REC SIGNAL
:PB SIGNAL
PG2502
PG1802
MPX IN
RT1801
RT1802
MTS INPUT LEVEL
MPX SEPA.
IC1801
MTS DECODER(USA)
IC1801
MPX DECODER(JAPAN)
IC1803
USA/JAPAN SELECT
[FOR JU]
MTS MODE
MPX AUDIO [J&U]
MAIN(AUDIO) [MAS]

MICROPROCESSOR PIN FUNCTION TABLES

1. LCD DRIVER μP (IC1701)

Pin No.	I/O	Active Level	Abbreviation	Function
1	–	–	SEGMENT (1)	Not used.
2	–	–	SEGMENT (2)	
5	–	–	SEGMENT (5)	
6	O	Pulse	SEGMENT (6)	LCD segment control outputs.
7	O	Pulse	SEGMENT (7)	
31	O	Pulse	SEGMENT (31)	
32	O	Pulse	SEGMENT (32)	
33	O	Pulse	COM1	LCD common (COM) control outputs.
34	O	Pulse	COM2	
35	O	Pulse	COM3	
36	I	Lo	RESET (L)	Initializes the LCD-μP when power is supplied.
37	I	Hi	VDD	A5V power input.
38	I	–	VDD 1	LCD drive bias.
39	I	–	VDD 2	LCD drive bias.
40	I	Lo	VSS	Ground.
41	I/O	–	OSC	Generates a 32kHz signal for key scanning.
42	I	Lo	LCD LOAD	LOAD signal between the LCD-μP and M-μP. "Lo" input enables chip select.
43	I	Pulse	CLOCK (M-LCD)	The data is transferred from the M-μP, synchronized with the clock signal.
44	I	Pulse	DATA (M-LCD)	

2. MAIN μP (IC901)

Pin No.	I/O	Active Level	Abbreviation	Function
1	O	Hi	BACK LIGHT	LCD backlight control signal. When LED lights: "L"; When LAMP lights: "H".
2	–	–	GND	Ground
3	I	A/D	SHUTTLE 2 (CLOCK FAST)	SHUTTLE A/D input signals
4	I	A/D	SHUTTLE 1	
5	I	A/D	KEY IN	Front key voltage data input
6	I	A/D	FL/TAB	FL mechanism loading/unloading detection, and TAB detection. Loading/unloading completed: 1.24 V or more; In transition state: less than 1.24 V / TAB present: 3.75 V or more
7	I	Lo	P. STOP	Power failure detection signal. "L" is input when power failure is detected ("L" when microprocessor voltage is 4.7 V or less).
8	I	Hi	S. CURVE	Fine tuning detection signal
9	I	A/D	MODE 2	Mechanism mode switching signals
10	I	A/D	MODE 1	
11	I	A/D	VIDEO ENV	Signals are A/D converted and input for autotracking
12	I	A/D	AUDIO ENV	
13	I	A/D	MDOEL SW	Switches models according to the input signal.
14	I	A/D	MTS MODE	MPX reception mode input signal. When receiving STEREO+BIL+SAP: "L"; STEREO: "ML"; BIL+SAP: "MH", MONO: "H".
15	I	–	VREF	A/D converter reference voltage
16	I	Lo	RESET	"L" input resets the microprocessor.
17	O	Hi	MONO OUT	When MPX IC output is forcibly set to MONO: "H"
18	O	Hi	ST/SAP OUT	When SAP audio is output: "H"
19	O	Lo	NC	
20	O	Hi	RF SYS (SW 1)	RF SYSTEM switching: When tuner sound mode is set to BG/DK: "L", when tuner sound mode is set to I: "H". Inverted by transistor.
	O	Hi	I SW	IF SOUND switching: When tuner sound mode is set to BG/DK: "H", when tuner sound mode is set to I/NTSC: "L". Inverted by transistor + pulled up.
21	O	Lo/Hi	PAL/NTSC SW	IF switching: When tuner reception mode is set to PAL: "H", when tuner reception mode is set to NTSC: "L"
22	I	–	VCC	Connected to backup power supply.
23	O	Pulse	SW25A	SW25 pulse for switching Hi-Fi heads
24	O	Pulse	SW25	SW25 pulse for switching WYC heads
25	O	PWM	CAP PWM	Capstan motor control PWM output
26	O	PWM	DRUM PWM	Drum motor control PWM output
27	O	Hi	V. PULSE	Artificial V sync pulse output
28	O	Pulse	C. ROTARY	Chroma rotation control signal. EX-OR with SW25 and H.AMP SW.
29	O	Hi/Lo	H. AMP SW	DA4 head switching signal
30	I	Hi/Lo	COMP	Compares outputs from SP and LP heads: when the LP head output is higher, "H" is input.
31	I/O	Pulse	CTL H (+)	CTL pulse input/output
32	I/O	Pulse	CTL H (–)	CTL pulse input/output
33	–	–	Vss (SRV)	GND
34	I	Pulse	CTL AMP I1	CTL amp gain switching input
35	I	Pulse	CTL AMP I2	CTL amp negative feedback input

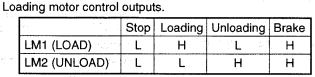
SHUTTLE A/D input signals

	–X11	–X5	–X1	–X1/7	0	X1/7	X1	X5	X11
SHU 1	2.5/1.9	1.9/2.5	2.5	1.9	5.0	3.2	5.0	5.0/3.2	5.0/3.2
SHU 2	2.5	1.9	3.2	3.2/5.0	5.0	5.0/3.2	3.2	1.9	2.5

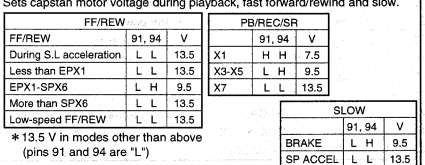
∗ CLOCK FAST when SHUTTLE 2 is 5 V or less

Mechanism mode switching signals

Position	2 UL	8 FF/REW	7 STP2	6 R/P	1 FL	5 FS	4 RFS	3 REV
MODE 1	3.05	3.0	2.50	1.80	1.80	0.00	0.00	0.00V
MODE 2	2.50	0.00	2.50	3.05	0.00	3.05	2.50	1.80V

Pin No.	I/O	Active Level	Abbreviation	Function
36	I	Pulse	CTL AMP I3	CTL amp input
37	O	Pulse	CTL AMP (0)	CTL amp output
38	I	Pulse	DRUM FG	Drum FG input
39	I	Pulse	DRUM PG	Drum PG input
40	I	Pulse	CFG	CFG input signal
41	I	–	Vcc (SRV)	S5V power supply for SRV
42	I	–	Vcc (OSD)	S5V power supply for OSD
43	I	–	CV IN	Video signal input (2 Vp-p, with sync tip clamp circuit)
44	I	–	Vref	Reference bias, clamp bias monitor pin
45	O	–	CV OUT	Composite video signal output (2 Vp-p)
46	I	–	CHAR Bias	For externally adjusting character luminance level
47	I	–	AFC LPF	An LPF for AFC is externally attached.
48	I	–	AFC OSC	Oscillator for AFC
49	I	–	GND (OSD)	Ground
50	I	Pulse	DOSC IN	LC or RC oscillator for generating dot clock
51	O	Pulse	DOSC OUT	LC or RC oscillator for generating dot clock
52	O	–	4fsc OUT	4fsc or 2fsc oscillator
53	I	–	4fsc IN	4fsc or 2fsc oscillator
54	I	Pulse	C. SYNC	C.SYNC input for video output
55	O	Hi	BLUE BACK	"H" during OSD blue background
56	O	Hi	HiFi REC	Hi-Fi audio recording signal. REC and V.DUB: "H". REC PAUSE and V.DUB PAUSE: "L".
57	I/O	Pulse	12C DATA (AV)	I2C communication data signal
58	O	Pulse	12C CLK (AV)	I2C communication clock signal
59	O	Lo	PB	Sets the video system to the playback mode. During playback: "L".
60	O	Hi	REVERSE	Capstan motor reverse control output ("H" for reverse drive)
61	O	Hi	A. REC	Linear audio recording signal. REC, A.DUB and A.DUB PAUSE: "H". REC PAUSE: "L".
62	O	Hi	CTL RESET	Adds reset pulse to CTL during REVERSE SLOW.
63	O	–	X' TAL CHG	OSD 14MHz/17MHz crystal switching signal. 14MHz (NTSC): "L", 17MHz (PAL): "H"
64	O	Hi	AV BUS OUT	AV bus control signal
	I	Lo	CK DET IN	Video killer detection signal. PLL locked: "L", PLL unlocked: "H"
65	O	Hi	LM2 (UNLOAD)	Loading motor control outputs.
66	O	Hi	LM1 (LOAD)	
67	O	Hi/Lo	LM CONT	Loading motor voltage control output
68	–	–	TEST	Ground
69	I	–	XCIN	For the connection of 32.768kHz crystal oscillator (tolerance: within ±5 ppm)
70	O	–	XCOUT	
71	I	–	GND	Ground
72	I	–	XIN	For the connection of 10MHz ceramic oscillator (tolerance: within ±0.50 ppm)
73	O	–	XOUT	
74	O	Hi	L. MUTE	Audio output system muting control. "H": Muting ON (used in common with FTZ muting)
75	I/O	Hi/Lo	CAPS Q. R	Capstan control signal. "H": Voltage control, "OPEN": Servo control, "L": Braking
76	I/O	Hi/Lo	DRUM Q. R	Cylinder control signal. Horizontal jitter correction.
77	O	Hi	POWER CONT	Switches S power supply on and off. "H": Power ON, "L": Power OFF (or "OPEN": When microprocessor is initialized)
78	O	Lo	SP	Tape speed control. PAL/NTSC SP mode: "L"

	Stop	Loading	Unloading	Brake
LM1 (LOAD)	L	H	L	H
LM2 (UNLOAD)	L	L	H	H

Pin No.	I/O	Active Level	Abbreviation	Function
79	I	Hi/Lo	MESECAM DET	MESECAM signal detection input. When MESECAM signal detected: "H". Not connected and fixed at "L" for PAL models, not handling MESECAM signal.
80	O	Hi	REC	Video signal recording control. REC LED control signal. During REC, REC PAUSE, V.DUB, V.DUB PAUSE: "H".
81	O	Hi	MTS MUTE	Tuner audio muting signal. During playback, line input: "H". During MPX muting for channel switching: "H"
82	I	Pulse	IR. IN	Remote control receiving signal
83	O	Hi	3.58/4.43	Y/C equalizer control signal. 4.43 MODE: "L", 3.58 MODE: "H"
	O	Lo	IR SELECT	Control signal to inhibit remote control input during AV bus communications
84	I	Hi	CCD CE	CCD microprocessor chip enable
85	O	–	TIME SIGNAL	Audio time signal input for clock setting.
86	I	Lo	EST	End sensor inputs.
87	I	Lo	ESS	1. Used to detect whether or not a cassette is loaded into the US mechanism. With cassette: ESS or EST is "H". Without cassette: Both ESS and EST are "L". 2. Used to detect the start and end of tape. Tape start: EST "L" and ESS "H". Tape end: EST "H" and ESS "L".
88	I	Pulse	T. REEL	Reel pulses for detecting rotation of take-up reel disk
89	I	Pulse	S. REEL	Reel pulses for detecting rotation of supply reel disk
90	I	Lo	CHECK	Signal to detect short-circuit in S5V, S9V, PS5V and PS9V.
91	O	Hi/Mid/Lo	V. CAP. CONT 2	Sets capstan motor voltage during playback, fast forward/rewind and slow.
94	O	Hi/Mid/Lo	V. CAP. CONT	
92	I/O	Pulse	12C DATA	I2C communication data signal
93	O	Pulse	12C CLOCK	I2C communication clock signal
95	O	Pulse	CCD CLOCK	Clock signal for CCD communications
96	I	Pulse	CCD DATA IN	CCD data input
97	O	Pulse	CCD DATA OUT	CCD data output
98	O	Pulse	LCD CLOCK	Clock for serial data output to LCD
99	O	Hi	LCD CE	Data load signal to LCD
100	O	Pulse	CCD DATA	Serial data to LCD

FF/REW	91, 94	V
During S.L acceleration	L L	13.5
Less than EPX1	L L	13.5
EPX1-SPX6	L H	9.5
More than SPX6	L L	13.5
Low-speed FF/REW	L L	13.5

∗13.5 V in modes other than above (pins 91 and 94 are "L")

PB/REC/SR	91, 94	V
X1	H H	7.5
X3-X5	L H	9.5
X7	L L	13.5

SLOW	91, 94	V
BRAKE	L H	9.5
SP ACCEL	L L	13.5

3. CCD μP (IC4301)

Pin No.	I/O	Active Level	Abbreviation	Function
1	I	Pulse	H. SYNC	H.SYNC inversion input
2	I	Pulse	V. SYNC	V.SYNC inversion input
3	O	Hi/Lo	MESECAM DET	OSD chroma addition, Closed Caption through mode. Expansion output of MAIN μP MESECAM DET input. MESECAM: "H"
4	O	Hi/Lo	MAP LED	Lights when NAVI data retrieval and registration are completed: "H" During retrieval: Blinks
5	O	Pulse	OSD CS	OSD IC chip selection
6	O	Pulse	OSD/CM DATA OUT	Data output to OSD IC and CM microprocessor
7	O	Pulse	OSD/CM CLOCK	Clock used to transfer data to OSD IC and CM microprocessor
8	I	Pulse	CM DATA IN	Data input from CM microprocessor
9	I	Hi/Lo	CM EVENT	CM EVENT input
10	I	Hi/Lo	P. STOP	Power failure detection input
11	O	–	NC	
12	O	Hi/Lo	CM LED	CM LED output (unused)
13	O	Hi/Lo	EE MONI	EE monitor: "H"
14	I	–	AVCC	Power supply of analog circuits
15	O	–	HLF	For the connection of filter
16	I	–	VHOLD	For the connection of capacitor
17	I	–	CVIN	Video signal input
18	I	–	CNVSS	Ground
19	I	–	XIN	8MHz oscillator input/output
20	O	–	XOUT	
21	–	–	GND	Ground
22	A5V	–	VCC	Power supply (A5V)
23	O	Hi/Lo	L3/L3	Video switching output for EE monitor. L1/TUN: "L", L2: "H"
24	O	Hi/Lo	LINE/TUN	Video switching output for EE monitor. Line: "L", TUN: "H"
25	I	Lo	RESET	Reset input. RESET: "L"
26	O	Hi/Lo	REC LED	Lights during REC, REC PAUSE, TIMER REC, IRT: "H". Off during V.DUB, V.DUB PAUSE, A.DUB, A.DUB PAUSE: "L".
27	O	Hi/Lo	TIM LED	Lights during timer standby: "H"
28	O	Hi/Lo	PB	VP Plus/NAVI DATA switching output. During PLAY (VP Plus through): "H"
29	O	Hi/Lo	BLUE BACK	VP Plus/NAVI DATA switching output: Expansion output of MAIN μP BLUE BACK output. During no signal (VP Plus through): "H"
30	I	Pulse	CCD. ENABLE	CCD microprocessor enable input from MAIN μP
31	O	–	NC	
32	O	Pulse	I^2 CCLK	Communications with EEPROM
33	O	Hi/Lo	X'TAL CHANGE	OSD 4fsc oscillator switching. Expansion of MAIN μP X'TAL CHANGE output. PAL: "H", NTSC: "L"
34	I/O	Pulse	I^2C DATA	Communications with EEPROM
35	O	Pulse	R.N. BLANK	Blank output for NAVI data
36	I	Pulse	DATA IN (M --> C)	Data input from MAIN μP
37	O	Pulse	DATA OUT (C --> M)	Data output to MAIN μP
38	I	Pulse	CLOCK IN	Clock for communications with MAIN μP
39	O	Pulse	C. BLANK	Blank output for Closed Caption
40	O	Pulse	C. CO	Closed Caption output
41	O	–	NC	
42	O	Pulse	R.N. CO	NAVI data output

HITACHI

VT-FX8000E(AU)
VT-FX8000EM(GKI)NA TK No.4809E Image & Information Media Systems Division, Tokai
VT-FX8000EM(HKN)
VT-FX8000EM(JU)

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HITACHI

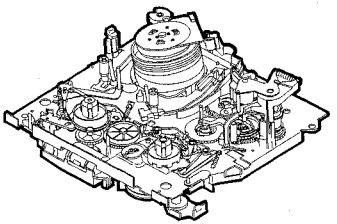
SERVICE MANUAL

TK | No.4527E

US Mechanism

This service manual includes the procedures to dismantle, adjust and maintain the US mechanism. Use this together with the manual of each VCR model.

VIDE-V17007



VHS
SVHS

Please read this service manual thoroughly before servicing. Be sure to observe the cautions described in this manual so the safety of the product can be maintained.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

April 1996 Image & Information Media Systems Division, Tokai

CONTENTS

CHAPTER 1 GENERAL INFORMATION

Appearances of US Mechanism 1-1
How to Remove the Cassette when a Malfunction Has Occurred in the Mechanism 1-3

CHAPTER 2 DISASSEMBLY

1. Before Starting Disassembly 2-1
2. Identifications and Locations of Components of US Mechanism..... 2-1
3. US Mechanism Disassembly Method 2-2
   Removal of Heads and Motors 2-2
   Removal of Tape Transport Parts 2-2
   Removal of Tape Drive Parts 2-3
   Removal of Guide Roller Assemblies 2-3
   Disassembly Procedure Diagrams 2-4
   3-1. FE head 2-4
   3-2. A/C head 2-4
   3-3. Cylinder motor assembly 2-4
   3-4. Capstan motor 2-4
   3-5. Loading motor 2-5
   3-6. Tension arm, tension band and jog arm 2-5
   3-7. Supply subbrake, supply reel disk, brake (L), idler gears 1 and 2 2-5
   3-8. Impedance roller and HC mechanism .. 2-6
   3-9. Pressure roller arm 2-6
   3-10. Spiral gear and P. out arm 2-6
   3-11. PR idler gear 2-7
   3-12. FS brake and P. drive gear 2-7
   3-13. Brake (R), Take-up brake, take-up reel disk and FR arm 2-8
   3-14. Safety arm 2-8
   3-15. Cam gear and LM wheel gear 2-8
   3-16. Loading gears (R) and (L) 2-9
   3-17. Pulley assembly, drive belt, torque change arm, torque change gear, FR drive gear and transmission gear 2-9
   3-18. FL idler gear and FL change gear ... 2-10
   3-19. Slider 2-10
   3-20. Cylinder base and guide roller assemblies 2-10
   Items to Check After Reinstalling the US Mechanism 2-11
4. Identifications and Locations of Parts in US-FL Mechanism 2-12
5. Procedure to Dismantle the US-FL Mechanism 2-12
   5-1. Door arm, switch arm, bevel gear and FL gear 2-12
   5-2. Side brackets (R) and (L), cassette holder and FL drive arm 2-13

CHAPTER 3 MECHANICAL ADJUSTMENT

1. List of Adjustment Jigs 3-1
2. Diagram showing Adjustment Locations 3-1
3. Tape Transport Component Adjustments 3-2
   3-1. Reel disk height adjustment 3-2
   3-2. Tension pole position check 3-3
   3-3. Guide roller height adjustment 3-3
   3-4. Audio/control (A/C) head adjustment .. 3-5
   3-5. Adjustments after replacing the cylinder 3-6
   3-6. Tension/Torque checks 3-7

CHAPTER 4 MECHANISM OPERATION CHECK AND MAINTENANCE/INSPECTION

Mechanism Operation Check 4-1
1. Method to set the VCR to the loading state without loading a cassette 4-1
2. Checking the operation in each mode 4-2
Maintenance/Inspection Procedure 4-3
1. Necessity of Maintenance and Inspection 4-3
2. Scheduled Maintenance and Inspection ... 4-3
3. Before Determining that the VCR is Faulty 4-3
4. Tools Needed for Inspection and Maintenance 4-4
5. Cleaning Procedure 4-4
6. Lubricating and greasing 4-4
7. Maintenance/Inspection Schedules of Mechanical Parts 4-5

CHAPTER 5 EXPLODED VIEWS

1. US-MECHANISM (TOP VIEW) SECTION 5-1
2. US-MECHANISM (BOTTOM VIEW) SECTION 5-2
3. US-FL MECHANISM SECTION 5-3
Identifications of Components in US Mechanism 5-4

CHAPTER 1 GENERAL INFORMATION

Appearances of US Mechanism

1. Top View of US Mechanism (I)

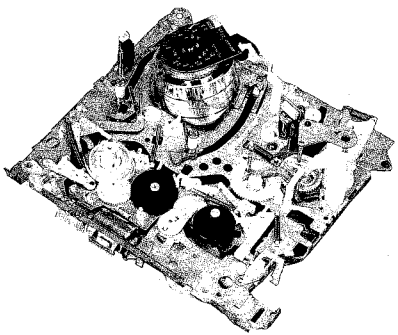


Fig. 1-1

2. Top View of US Mechanism (II)

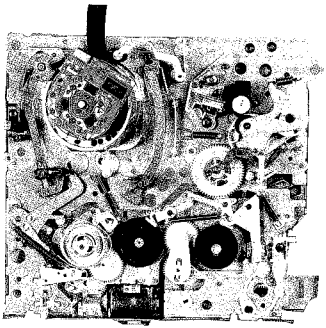


Fig. 1-2

3. Bottom View of US Mechanism (I)

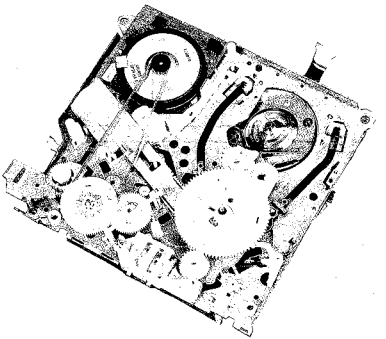


Fig. 1-3

4. Bottom View of US Mechanism (II)

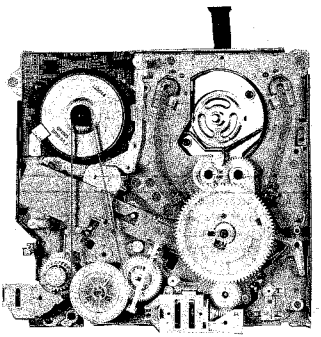


Fig. 1-4

How to Remove the Cassette when a Malfunction Has Occurred in the Mechanism

If a cassette is caught in the mechanism because of a malfunction in the mechanism, remove it by the following procedure.

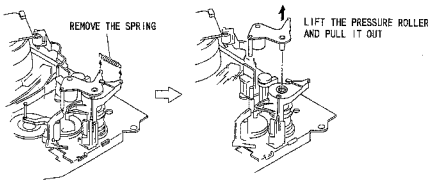
[Work Procedure]

1. Remove the top cover.
2. Remove the front panel.

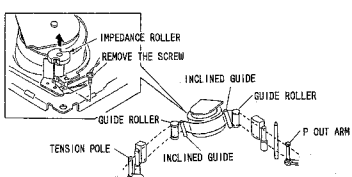
If the tape is wound round the cylinder in the loading state

If the cassette does not come out from the FL mechanism in the unloading state.

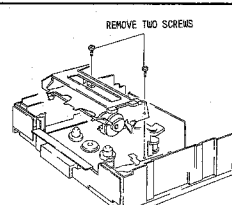
Remove the spring and lift the pressure roller to pull it out.



1) Remove the screw and lift the impedance roller together with the impedance plate.
2) Slacken the tape and release it from the tension pole, guide rollers, inclined guides and P out arm.



1) Remove two screws holding the FL mechanism.
2) Hold the cassette lid with your fingers so the tape is not damaged and remove the FL mechanism.
3) Remove the slack tape and eject the cassette.



CHAPTER 2 DISASSEMBLY

1. Before Starting Disassembly

1) Unplug the power cord from the AC outlet.
2) [Removal procedure]
If a special procedure is required when dismantling any component, it is indicated using numbers. Follow the numbers (①, ②, ③ ...) shown in the illustrations.

[Reinstallation procedure]
Reinstall each component in the reverse order to removal when otherwise not specified.

2. Identifications and Locations of Components of US Mechanism

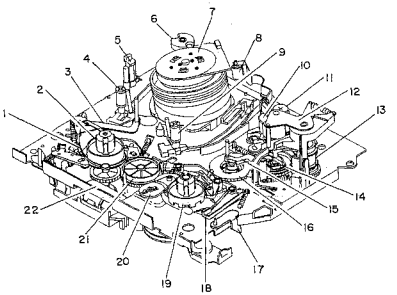


Fig. 2-1 Top View of US Mechanism

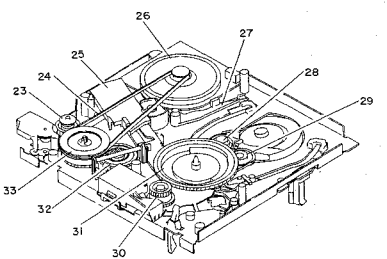


Fig. 2-2 Bottom View of US Mechanism

1. Tension band
2. Supply reel disk
3. Tension arm
4. Supply guide roller
5. Full erase (FE) head
6. Impedance roller
7. Cylinder motor
8. HC mechanism
9. Take-up guide roller
10. Audio/control (A/C) head
11. Capstan shaft
12. Pressure roller arm
13. Spiral gear
14. PR idler gear
15. P. out arm
16. P. drive gear
17. S-VHS switch (S-VHS VCR only)
18. Take-up brake
19. Take-up reel disk
20. FR arm
21. Idler gear 2
22. Loading motor
23. FL change gear
24. Drive belt
25. Slider
26. Capstan motor
27. FS brake
28. Loading gear (R)
29. Loading gear (L)
30. LM wheel gear
31. Cam gear
32. Torque change gear
33. Pulley assembly

3. US Mechanism Disassembly Method

When replacing defective parts, first refer to the "parts hierarchy chart" shown below. This chart shows the procedure for parts removal when replacing defective parts.

[How to use the parts hierarchy chart]

(1) Locate the part to be replaced.
(2) Check the parts in the ranks above the part to be replaced and start dismantling.
(3) Replace the defective part and reinstall the parts in the reverse order to that shown in the parts hierarchy chart.

Removal of Heads and Motors

Note: Dismantle parts in the eject state.

Parts to remove	Item
FE head	3-1
A/C head	3-2
★ Cylinder motor	3-3
★ Capstan motor	3-4
★ Loading motor	3-5

Removal of Tape Transport Parts

Note: Dismantle parts in the eject state.

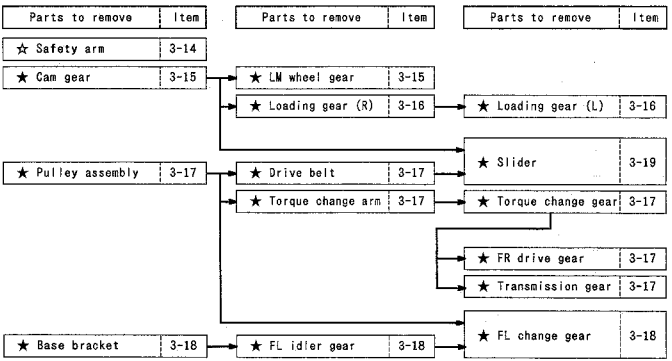
Parts to remove	Item	Parts to remove	Item	Parts to remove	Item
☆ Tension arm	3-6	☆ Tension band	3-6		
		☆ Jog arm	3-6		
		☆ Supply subbrake	3-7	☆ Supply reel disk	3-7
☆ Brake (L)	3-7	☆ Idler gear 2	3-7	☆ Idler gear 1	3-7
Impedance plate	3-8	Impedance roller	3-8		
HC mechanism	3-8	★ FS brake	3-12		
Pressure roller arm	3-9	☆ Spiral gear	3-10		
☆ P. out arm	3-10	☆ PR idler gear	3-11	★ P. drive gear	3-12
☆ Brake (R)	3-13	☆ Take-up brake	3-13		
		☆ Take-up reel disk	3-13	☆ FR arm	3-13

◆ How to interpret the symbols

- Dismantle the parts marked ☆ after the FL mechanism has been removed.
- Dismantle the parts marked ★ after the US mechanism has been removed from the VCR.
- The parts without any marks can be replaced with the top cover removed.

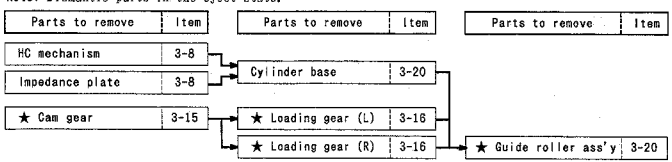
Removal of Tape Drive Parts

Note: Dismantle parts in the eject state.



Removal of Guide Roller Assemblies

Note: Dismantle parts in the eject state.



◆ How to interpret the symbols
- Dismantle the parts marked ☆ after the FL mechanism has been removed.
- Dismantle the parts marked ★ after the US mechanism has been removed from the VCR.
- The parts without any marks can be replaced with the top cover removed.

3-1. FE head

◆ Caution when reinstalling

1) Clean the surfaces of the FE head and supply guide roller with which the tape comes into contact.

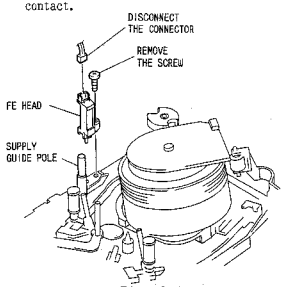


Fig. 3-1

3-2. A/C head

◆ Caution when reinstalling

1) Clean the surface of the A/C head with which the tape comes into contact.

◆ Mechanism adjustment after reinstalling

1) Audio/control (A/C) head adjustment

◆ Electrical adjustment after reinstalling

1) X-value adjustment

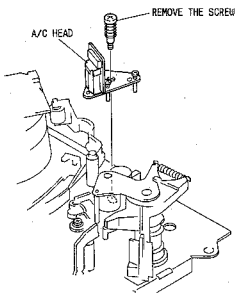


Fig. 3-2

3-3 Cylinder motor assembly

◆ Caution during work

1) Do not touch the video head tips.

◆ Mechanism adjustment after reinstalling

1) Adjustments after replacing the cylinder

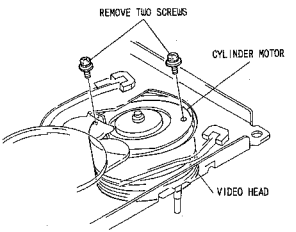


Fig. 3-3

3-4. Capstan motor

◆ Caution when reinstalling

1) Clean the surface of the capstan shaft with which the tape comes into contact.

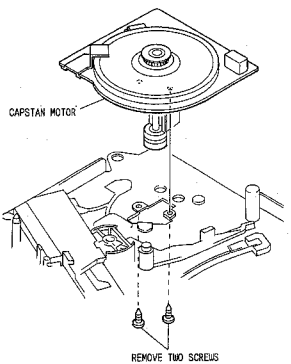


Fig. 3-4

3-5. Loading motor

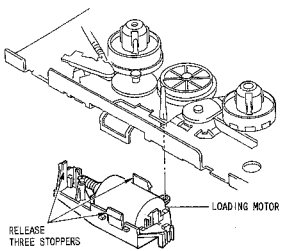


Fig. 3-5

3-6. Tension arm, tension band and jog arm

◆ Caution when reinstalling

1) Clean the surface of the tension pole with which the tape comes into contact.

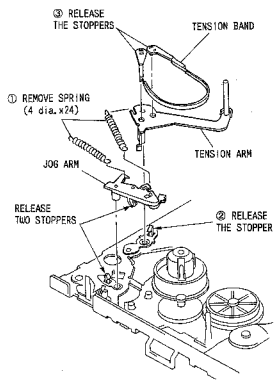


Fig. 3-6

3-7. Supply subbrake, supply reel disk, brake (L), idler gears 1 and 2

◆ Mechanism adjustment after reinstalling

1) Reel disk height adjustment

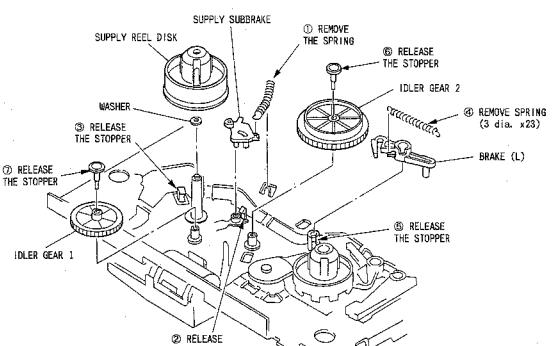


Fig. 3-7

3-8. Impedance roller and HC mechanism

◆ Caution when reinstalling

1) Check that the HC mechanism arm is set to the specified position.

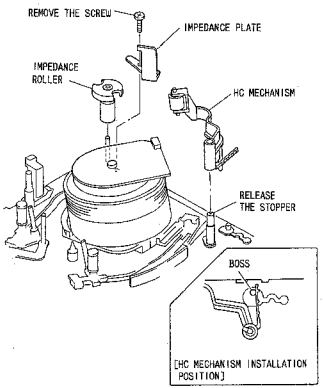


Fig. 3-8

3-9. Pressure roller arm

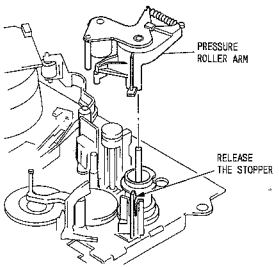


Fig. 3-9

3-10. Spiral gear and P. out arm

◆ Cautions when reinstalling

1) Align the gear positions of the spiral gear and PR idler gear.
2) Clean the surface of the P. out arm with which the tape comes into contact.
3) Check that the P. out arm is set to the specified position.
4) Turn the lid opener counterclockwise to lock it.

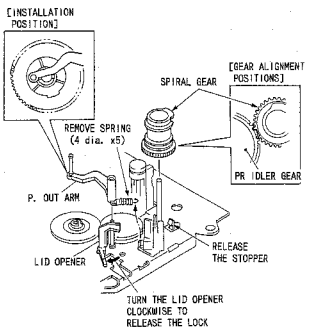


Fig. 3-10

3-11. PR idler gear

◆ Caution when reinstalling

1) Align the gear positions of the P. drive gear and PR idler gear.

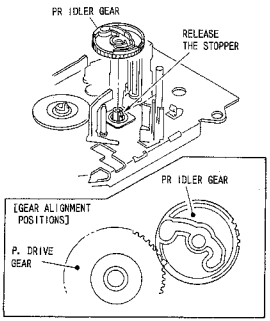


Fig. 3-11

3-12. FS brake and P. drive gear

◆ Caution when reinstalling

1) Align the positions of the P. drive gear and slider.

[Items to be checked around the pressure roller]

(A) Engaged section between the spiral gear and PR idler gear

(B) △ mark (No. 1) on the P. drive gear and ▽ mark on the spring hook

(C) Engaged section between the PR idler gear and P. drive gear

(D) The lid opener is locked in the specified position.

(E) Engaged section between the P. drive gear and slider

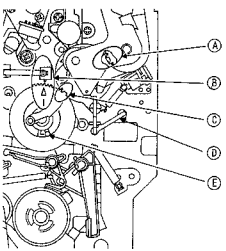


Fig. 3-12

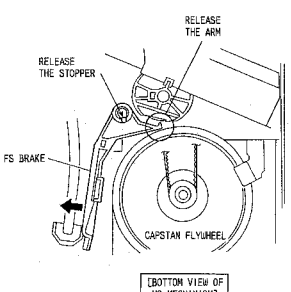


Fig. 3-13

3-13. Brake (R), take-up brake, take-up reel disk and FR arm

◆ Mechanism adjustment after reinstalling

1) Reel disk height adjustment

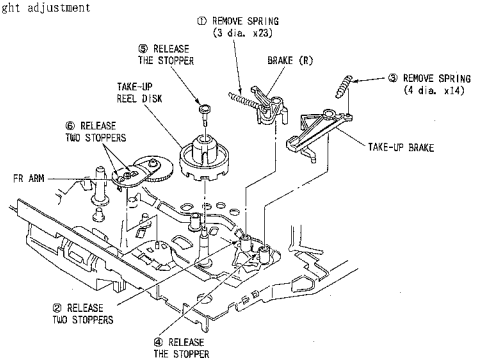


Fig. 3-14

3-14. Safety arm

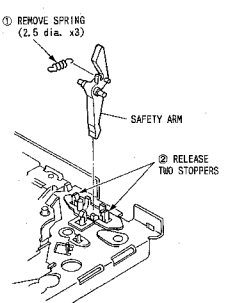


Fig. 3-15

3-15. Cam gear and LM wheel gear

◆ Caution when reinstalling

1) Align the positions of the cam gear and slider.

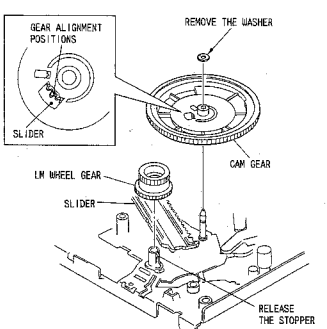


Fig. 3-16

3-16. Loading gears (R) and (L)

◆ Caution when reinstalling

1) Align the positions of loading gears (R) and (L).

【Items to check concerning gear alignment around loading gears】

(A) Engaged section between loading gears (R) and (L)

(B) Engaged section between the cam gear and slider

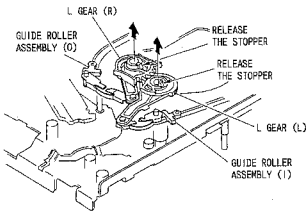


Fig. 3-17

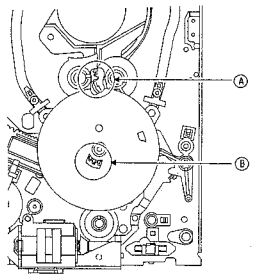


Fig. 3-18

3-17. Pulley assembly, drive belt, torque change arm, torque change gear, FR drive gear and transmission gear

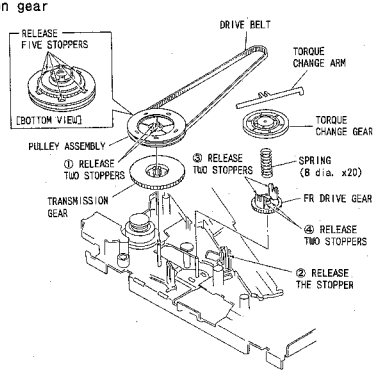


Fig. 3-19

3-18. FL idler gear and FL change gear

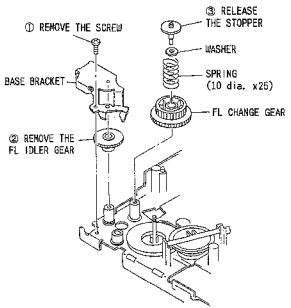


Fig. 3-20

3-19. Slider

◆ Tips when reinstalling

1) Align the projection at the left of the slider and the boss of the chassis.
2) Pull the take-up brake in the direction of the arrow and reinstall the slider.

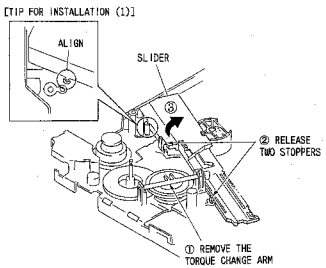


Fig. 3-21

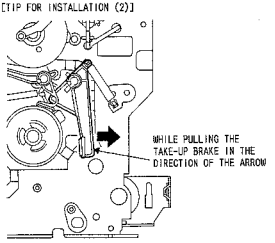


Fig. 3-22

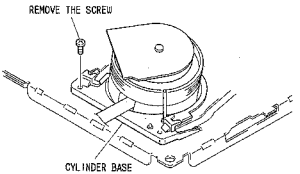
3-20. Cylinder base and guide roller assemblies

◆ Caution when reinstalling

1) Clean the surfaces of the guide rollers with which the tape comes into contact.

◆ Mechanism adjustment after reinstalling

1) Guide roller height adjustment



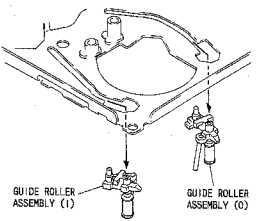


Fig. 3-23

Items to Check After Reinstalling the US Mechanism

After dismantling the mechanism or replacing its components, reinstall the components in their original positions correctly and perform the following checks.

Checking the surface of US mechanism

(A) The HC mechanism is set in the correct position.
(B) The engaged section between the spiral gear and PR idler gear is correct.
(C) The engaged section between the PR idler gear and P. drive gear is correct.
(D) The P. out arm is set to the correct position.
(E) The engaged section between the P. drive gear and slider is correct.

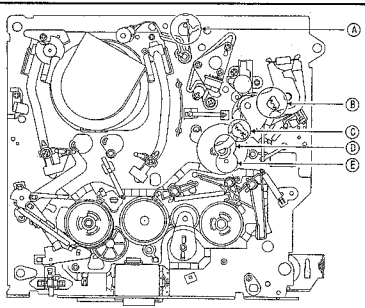


Fig. 3-24

Checking the bottom of US mechanism

(A) The projection of the slider and the boss of chassis are aligned.
(B) The engaged section between the loading gears (R) and (L) is correct.
(C) The sections in which the cam gear and slider are engaged are correct.

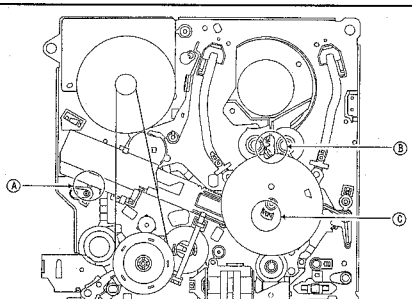
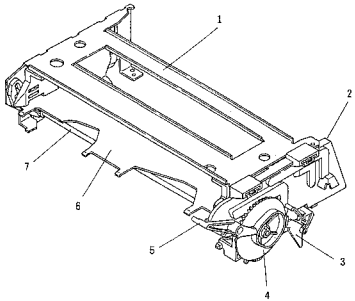


Fig. 3-25

4. Identifications and Locations of Parts in US-FL Mechanism



1. Side bracket (L)
2. Side bracket (R)
3. Switch arm
4. Bevel gear
5. Door arm
6. Cassette holder
7. FL drive arm

Fig. 4-1

5. Procedure to Dismantle the US-FL Mechanism

5-1. Door arm, switch arm, bevel gear and FL gear

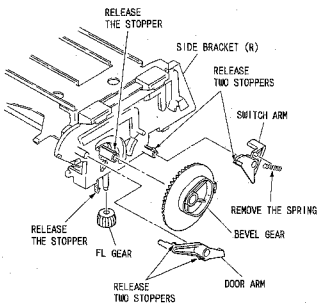


Fig. 5-1

◆ Caution when reinstalling

1) Reinstall the bevel gear so the holders in the bevel gear and side bracket (R) are aligned.

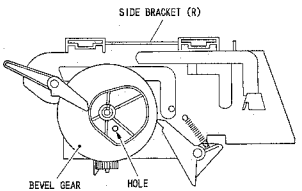


Fig. 5-2

5-2. Side brackets (R) and (L), cassette holder and FL drive arm

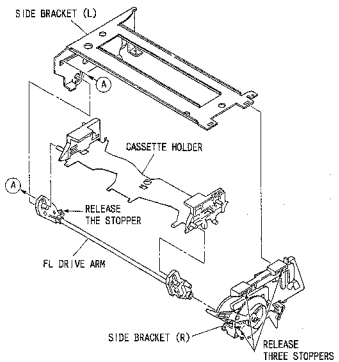


Fig. 5-3

◆ Cautions when reinstalling

1) Check the insertion of seven bosses.
2) Align hole (a) in side bracket (R) and the hole in the bevel gear.

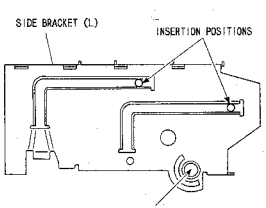


Fig. 5-4

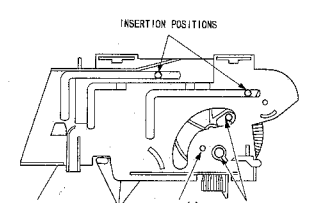
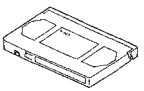
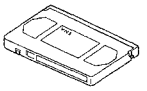
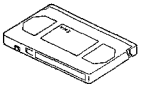
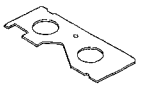
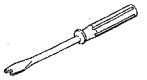


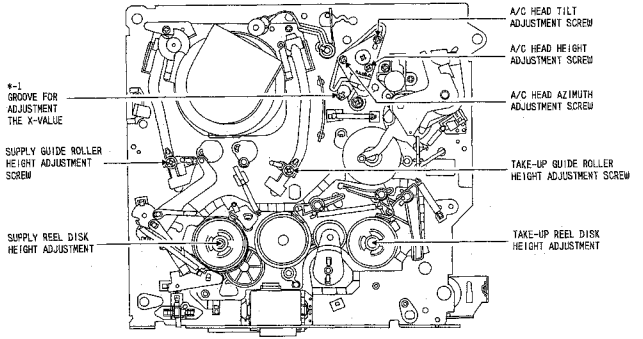
Fig. 5-5

CHAPTER 3 MECHANICAL ADJUSTMENT

1. List of Adjustment Jigs

1. NTSC Alignment Tape (For NTSC) Part No.7099046 	2. 30HMP2-1 Alignment Tape (For NTSC) Part No.7099089 	3. PAL Alignment Tape (For PAL) Part No.7099052 
4. Master Plane Part No.7099279 	5. Torque Gauge Part No.7099039	6. Torque Gauge Adapter Part No.7099035
7. Reel Disk Height Jig Part No.7099038	8. Guide Roller Adjustment Screwdriver Part No.7069064 	

2. Diagram showing Adjustment Locations


A/C HEAD TILT ADJUSTMENT SCREW
A/C HEAD HEIGHT ADJUSTMENT SCREW
*-1 GROOVE FOR ADJUSTMENT THE X-VALUE
A/C HEAD AZIMUTH ADJUSTMENT SCREW
SUPPLY GUIDE ROLLER HEIGHT ADJUSTMENT SCREW
TAKE-UP GUIDE ROLLER HEIGHT ADJUSTMENT SCREW
SUPPLY REEL DISK HEIGHT ADJUSTMENT
TAKE-UP REEL DISK HEIGHT ADJUSTMENT

*-1: For X-value adjustment, refer to the chapter on electrical adjustment in the service manual of each model.

3. Tape Transport Component Adjustments

The tape transport system is a generic term for the path from the supply reel disk to the take-up reel disk via the cylinder (video heads). The tape transport components, especially the components which come into direct contact with the tape, must be kept clean without damage, dust, oil. etc. adhering to the contact surfaces.
When replacing components in the tape transport system, adjust only the new components so the transport system is stabilized.

3-1. Reel disk height adjustment

Purpose: To set the height of reels in the cassette to the specified value so the tape height is determined.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Master plane (Parts No.7099279) · Reel disk height jig (Parts No.7099038)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	———	· Washers in the supply and take-up reel disks

Adjustment procedure

1) Check that the reel disk is placed between sections A and B of the reel disk height jig.
2) If the above cannot be confirmed, replace the washers (0.5 mm thick) of the reel disk or adjust the number of washers.

[Procedure to replace supply reel disk washers]

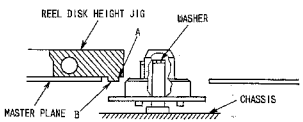
1) Remove the tension arm and tension band.
2) Remove the supply subbrake.
3) Lift the supply reel disk and replace the washers or adjust the number of washers.

[Procedure to replace take-up reel disk washers]

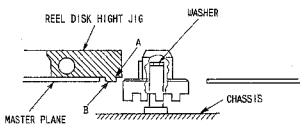
1) Remove brake (R).
2) Lift the take-up reel disk and replace the washers or adjust the number of washers.

Adjustment diagram

[SUPPLY REEL DISK]



[TAKE-UP REEL DISK]



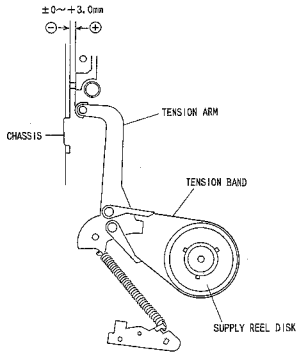
3-2. Tension pole position check

Purpose: To keep the tension of the tape to be supplied constant so the contact between the heads and tape is stabilized.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
———	———	1) Remove the top cover. 2) Set the VCR to the loading state without inserting a cassette. (See page 4-1)	———

Checking procedure
1) Check that the gap between the tension arm and the end of the chassis is ±0 ~ +3.0 mm.
2) If the tension pole position drifts greatly after checking, replace the tension band.

Checking diagram



3-3. Guide roller height adjustment

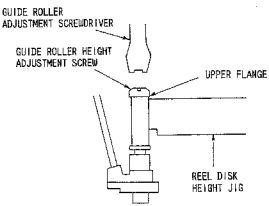
Purpose: To regulate the height of the tape so the bottom of tape runs along the tape guideline on the cylinder.

Coarse adjustment

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Master plane (Part No.7099279) · Reel disk height jig (Part No.7099038) · Adjustment screwdriver (Part No.7069064)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	———	Height adjustment screws on the supply and take-up guide rollers

Adjustment procedure
1) Turn the height adjustment screw so the upper flange of the guide roller and the top surface of the reel disk height jig are aligned.
2) Continue the precise adjustment.

Adjustment diagram

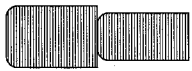
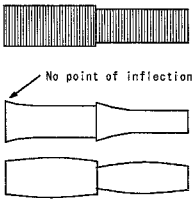
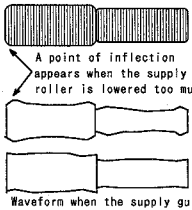


Precise adjustment

Test equipment/jig	Test equipment connection points	State of VCR	Adjustment points
· Oscilloscope	· CH-1: PB FM · CH-2: SW25Hz or 30Hz	· Play alignment tape (Colour bars section)	· Guide roller height adjustment screws
· Alignment tape	———		

Adjustment procedure
1) Set the VCR to the X-value adjustment test mode.
2) Play the alignment tape and press the tracking up and down buttons simultaneously to set the tracking to the centre.
(When performing this adjustment after replacing the cylinder, set the tracking so the FM output is maximum.)
3) Turn the height adjustment screw little by little so the FM output waveform is flat.
4) Press the tracking up and down buttons and fine adjust the height adjustment screw so the drop in the FM output becomes as shown in the good example in the figure.
5) Release the test mode.

Waveforms

Tracking	Good example	Bad example
When set to centre		
When up and down buttons are pressed		

3-4. Audio/control (A/C) head adjustment

Purpose: To keep the contact between the tape and head constant so the specified track can be recorded and played back.

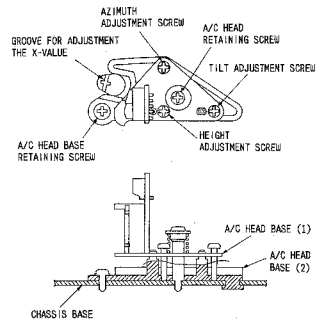
Since the height of A/C head (service part) is adjusted when the VCR leaves the factory, do not turn the height adjustment screw, tilt adjustment screw or azimuth adjustment screw unnecessarily.

Rough adjustment

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Blank tape		· Run the blank tape.	· Azimuth adjustment screw · Height adjustment screw · Tilt adjustment screw

Adjustment procedure/adjustment diagrams

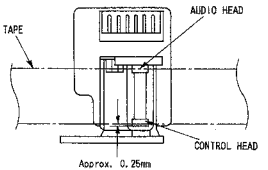
1) Load a blank tape and set the VCR to the playback mode.
2) Check that there is no conspicuous curling or riding over of the tape around the A/C head. If conspicuous curling or riding over, etc. occurs, adjust the tilt adjustment screw and azimuth adjustment screw.



When adjusting the height of the A/C head

Set the VCR to the playback mode. If the height of the A/C head drifts greatly, adjust it by the following procedure.

1) Adjust the height so the tape's bottom edge is approximately 0.25mm above the bottom edge of the control head core.
2) Check that there is no conspicuous curling or riding over of the tape around the A/C head.
3) Continue the precise adjustment.



Precise adjustment

Test equipment/jig	Test equipment connection point	State of VCR	Adjustment points
· Oscilloscope · Alignment tape	· AUDIO output jack	· Play alignment tape (Stairsteps section)	· Azimuth adjustment screw · Tilt adjustment screw · Height adjustment screw

Adjustment procedure

1) Adjust the azimuth adjustment screw and tilt adjustment screw alternately little by little so the audio output is maximum and flat (with minimum fluctuations).

Supplement: When the A/C head height has been adjusted, also adjust the height adjustment screw alternately with the azimuth and tilt adjustment screws.

Waveform diagram

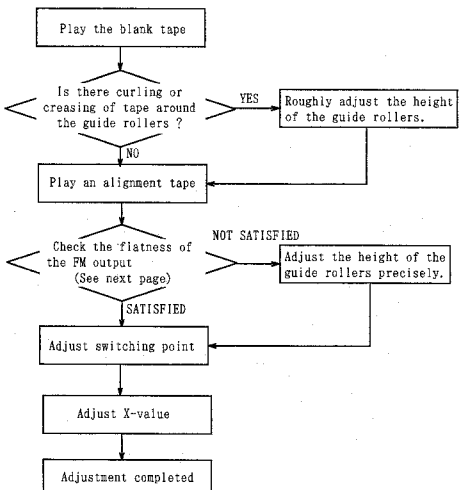
A: Maximum BB': Minimum

3-5. Adjustments after replacing the cylinder

Purpose: To eliminate drift in the relative height with the guide rollers, the X-value, etc. However, this drift is very small when the cylinder has been replaced correctly.

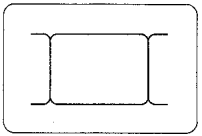
Test equipment/jig	Test equipment connection points	State of VCR	Adjustment points
• Oscilloscope	• CH-1: PB FM • CH-2: SW25Hz or 30Hz	• Run the blank tape	• Guide rollers (precise adjustment on page 3-4)
• Alignment tape	———	• Play alignment tape (Stairsteps section)	(Electrical adjustment) • Head switching point • X-value
• Blank tape	———		

Adjustment procedure

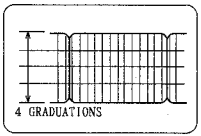

Play the blank tape
Is there curling or creasing of tape around the guide rollers ?
YES
Roughly adjust the height of the guide rollers.
NO
Play an alignment tape
Check the flatness of the FM output (See next page)
NOT SATISFIED
Adjust the height of the guide rollers precisely.
SATISFIED
Adjust switching point
Adjust X-value
Adjustment completed

Checking the flatness and fluctuations of FM output / waveform diagrams

1) Activate autotracking.

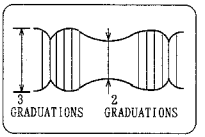


2) Finely adjust the voltage level range of the oscilloscope so the FM output is set to 4 graduations.



3) Adjust the tracking so the maximum amplitude of the FM output is set to 3 graduations.

4) Check that the minimum amplitude is more than 2 graduations at this time.



5) Check that the difference between the maximum and minimum level fluctuations is less than 12%.

3-6. Tension/Torque Checks

Purpose: It is necessary to check the tension, torque, compression strength at the tape take-up and moving sections to smooth the running of tape and satisfy the basic performance of the VCR. Perform this check if the running of tape is not smooth or the tape speed is abnormal.

Test equipment/jigs	State of VCR
· Torque gauge · Torque gauge adapter	· Set the VCR to each operation mode without inserting a cassette. (See page 4-1)

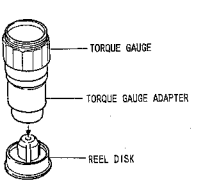
Item	VCR operation mode	Measured reel	Measured value
Main brake torque	Stop (Note)	Supply & take-up reels	100 ~ 300 g·cm
Slack removal torque	Unloading	Supply reel	95 ~ 180 g·cm
Fast forward torque	Fast forward	Take-up reel	400 g·cm or more
Rewind torque	Rewind	Supply reel	400 g·cm or more
Take-up torque	Playback	Take-up reel	45 ~ 75 g·cm
Back-tension torque	Fast forward/Rewind	Supply & take-up reels	5 ~ 20 g·cm
Playback back-tension torque	Playback	Supply reel	25 ~ 36 g·cm
Reverse search torque	Reverse search	Supply reel	95 ~ 250 g·cm
Reverse play torque	Reverse play	Supply reel	95 ~ 150 g·cm
Slow torque	Slow	Take-up reel	30 ~ 75 g·cm
Take-up brake torque	Reverse search	Take-up reel	65 ~ 100 g·cm

Checking procedure

Mount the torque gauge and torque gauge adapter and hold the torque gauge with your fingers for measurement.

Note : Measure in the loading stop-2 state. (See next page.)

Adjustment diagram



CHAPTER 4 MECHANISM OPERATION CHECK AND MAINTENANCE/INSPECTION

Mechanism Operation Check

Check the mechanism operation after dismantling and adjusting the mechanical block.
Check the operation after setting the mechanism to the loading state without loading a cassette.
If the mechanism does not operate normally, recheck the components and sections related to the area of the abnormality.

1. Method to set the VCR to the loading state without loading a cassette

Unplug the mains lead from the AC outlet.

↓

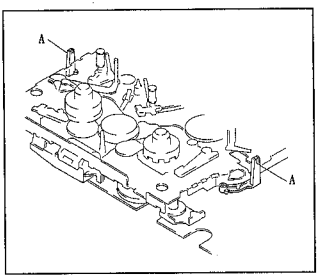
Remove the top cover and front panel.

↓

Remove the US front loading (FL) mechanism.

↓

Cover the end sensors (sections A in the figure on the right) with black masking tape, etc. to shut off light.



↓

Plug the mains lead into an AC outlet again and turn the VCR on.

↓

The cylinder rotates and the guide rollers are set to the loading state.
The VCR stands by in the LOADING-STOP 1 mode (mode switch position: 6). *-1

*-1: The VCR can accept the inputs of each mode in this state. However, rewinding can be done for no more than several seconds and the mains supply is shut off because the take-up reel disk is in the stop state and reel pulses cannot be detected. Turn the take-up reel disk manually for rewind operation.

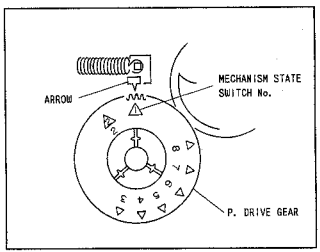
→ Proceed to the operation check on the next page.

↓

When the stop mode continues for one minute, the pressure roller and tension arm will no longer be pressed. The VCR enters the LOADING-STOP 2 mode (mode switch position:7). After five more minutes, the cylinder is stopped.

[Method to check the position of the mechanism mode switch]

Check the mode position by observing the arrow on the spring hook which is positioned in front of the A/C head and the arrow no. on the P. drive gear.



2. Checking the operation in each mode

Operation in each mode	Mode switch position
LOADING-STOP 1 mode	6

Recording/playback modes

Press the record or playback button of the VCR. The take-up reel disk starts to turn.	6
Press the stop button of the VCR. The take-up reek disk stops.	6

* To set to the record mode, pull the safety arm forward.

Still play mode

Press the playback button of the VCR. The take-up reel disk starts to turn.	6
Press the pause button. Take-up reel disk and capstan stop.	5
Press the stop button. The take-up reel disk and capstan turn forward and then stop.	6

Record pause mode

Press the record button of the VCR. The tension arm is released and the supply reel disk turns in reverse.	3
The tension arm is pressed and the take-up reel disk and capstan shaft to turn forward.	6
Press the pause button. The tension arm is released and the supply reel disk turns in reverse, then the take-up reel disk and capstan shaft turn forward. When the start of a programme is located, the VCR enters the pause mode.	3 ↓ 5

Rewind mode

Press the rewind button. The tension arm is released and the T-brake is applied.	6 ↓ 3
The reel disk starts to turn.	3
Press the stop button. The T-brake is released and the tension arm is pressed.	6

After completing the check, be sure to reset the VCR to the original state by the following procedure.

1) Turn the VCR off.
2) Remove the masking tape, etc. from the supply and take-up end sensors.
3) Unplug the mains lead from the AC outlet to reset the microprocessor(s).
4) Install the cassette loading mechanism to complete the work.

Maintenance/ Inspection Procedure

1. Necessity of Maintenance and Inspection

The recording density of a VCR is much higher than that of an audio recorder. A VCR uses very precise components to ensure compatibility with other VCRs. If any of mechanical components are worn or dirty, the symptoms will be the same as if the VCR has malfunctioned. To ensure a good picture, it is necessary to clean and lubricate the mechanism periodically and replace worn-out components.

2. Scheduled Maintenance and Inspection

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR and the environment in which the VCR is used. But, in general home use, a good picture is ensured if inspection and maintenance are done every 1,000 hours of use. Table 1 shows the relation between the time used and inspection period.

3. Before Determining that the VCR is Faulty

When a VCR has been used for over 1,000 hours, the symptoms shown in Table 2 may be seen in the playback picture. These faults may be remedied by cleaning and lubricating mechanical components. Check the hours for which the VCR has been used referring to Table 1. If you determine that the VCR is ready for inspection and maintenance, check the inspection locations shown in Table 2.

Caution: If the VCR cannot be restored to normal operation after cleaning components marked "○" in the part replacement column, they are degraded. Replace them.

Table 1

Average hours used per day	When inspection is necessary: 1 year	18 months	3 years
One hour			
Two hours			
Three hours			

Table 2

Symptom	Cause	Inspection location	Replacement
Colour beats	Dirt on full erase (FE) head	Clean the surface of FE head which is in contact with tape	
Poor S/N, no colour	Dirt on video heads (or they are degraded)	Clean video heads	○
Vertical jitter, horizontal jitter	Dirt on video heads and cylinder. Dirt in tape transport system.	Clean video heads and cylinder. Clean guide rollers and inclined guides.	
Low volume or sound distorted	Dirt on audio/control (A/C) head	Clean the surface of the A/C head which is in contact with tape	○
Tape is slack or does not run	Dirt on pressure roller	Clean pressure roller and capstan shaft	○

Inspection Locations

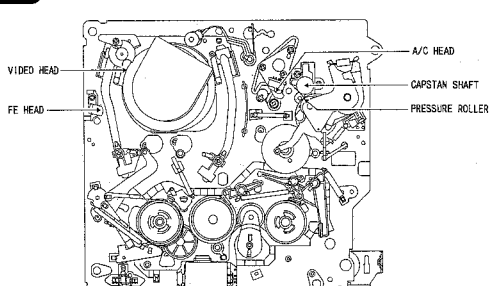


Fig. 1 Inspection Location Diagram

4. Tools Needed for Inspection and Maintenance

(1) Head cleaning kit (Fig. 2)
(2) Grease and oil for maintenance (Fig. 3)
(3) Alcohol
(4) Gauze

Fig. 2

Table 3 Locations for Use of Oil and Grease for Maintenance

Name	Lubricating or greasing location
Sonic Slidas Oil (#1600)	Lubricate low-speed rotating sections
Molicoat (PG-641)	Coat metal and mold sections under light load

5. Cleaning Procedure

1) Cleaning the video heads (Fig. 4)
First use a cleaning tape. If the dirt on the heads is too stubborn to be removed by the tape, use the head cleaning kit to clean the heads by the following procedure.
Moisten the cleaning stick with cleaning fluid and touch the head tip with the stick and gently turn the head (rotate the cylinder) to the left and right. (Do not move the stick vertically and be sure that only the chamois leather on the stick touches the head tips. Otherwise, the heads may be damaged.) After cleaning, thoroughly dry the heads, then run the tape. If cleaning fluid remains on the heads, the tape may be damaged when it comes into contact with the heads.
2) Cleaning the tape transport system (Fig. 3)
Moisten gauze with alcohol and use it to clean components ① - ⑬ (see "cleaning the video heads" for component ⑦).
Caution: When cleaning, take great care not to damage tape transport components or deform them by applying excessive force.

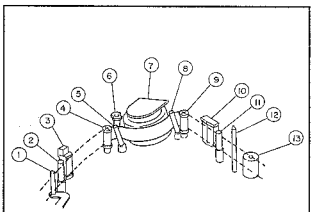


Fig. 3

6. Lubricating and Greasing

1) Lubricating guidelines
Use the oiler to apply one or two drop of Sonic Slidas oil. Make sure not to use too much oil because it may spill over and leak out, coming into contact with rotating parts and causing slippage or other problems. If too much oil is applied, wipe clean using gauze moistened with alcohol.
2) Greasing guidelines
Apply grease (Molicoat) with a stick or brush. Do not use too much grease. It may come into contact with the tape transport or drive system. Wipe off any excess and clean with gauze moistened with alcohol.
3) Oil or grease the specified locations referring to Table 4 on the next page.

[Cleaning method]

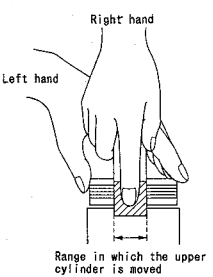


Fig. 4

7. Maintenance/Inspection Schedules of Mechanical Parts

Caution: This timetable shows the period when each component is required to be maintained and inspected. Use the following table as a reference as the maintenance/inspection period depends on how the unit is used and the environment in which it is used.
For components indicated as C/R, replace components if the VCR does not become normal after being cleaned.

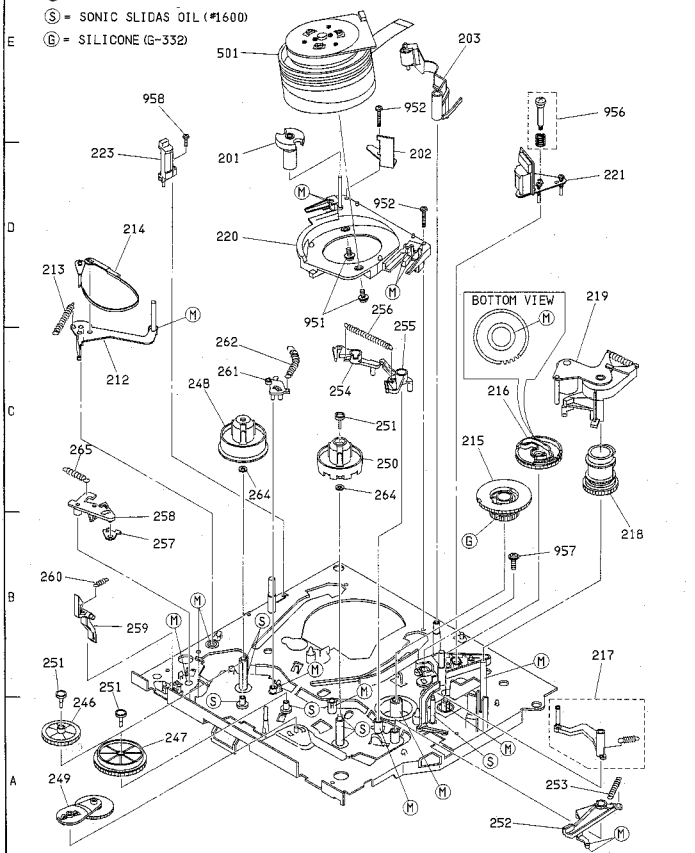
Table-4

Component	Hours				
	1000	2000	3000	4000	5000
Video heads (cylinder motor)	C/R	C/R	C/R	C/R	C/R
Audio/control (A/C) head	C	C/R	C	R	C
Full erase (FE) head	C	C	C	R	C
Supply guide roller	C	C	C/R	C	C
Take-up guide roller	C	C	C/R	C	C
Tension band		R		R	
Tension arm	C	C	C	C	C
Supply reel disk		C		C	
Take-up reel disk		C		C	
Pressure roller assembly	C	R	C	R	C
Drive belt		C		C	
Capstan motor	C	R	C	R	C
Loading motor				R	
Cylinder motor		R		R	
Mechanism state switch				(R)	
Idler gear 1		R		R	
Idler gear 2		R		R	
FR gear		R		R	
Supply slant pole	C	C	C	C	C
Take-up slant pole	C	C	C	C	C
Impedance roller	C	C	C	C	C
Guide pole	C	C	C	C	C
Tape guideline on cylinder	C	C	C	C	C
Brake (L)	C	C/R	C	C/R	C
Brake (R)	C	C/R	C	C/R	C
HC arm					(R)
Shaft and bearing of supply reel disk		S		S	
Shaft and bearing of take-up reel disk		S		S	
Shaft and bearing of idler gear 1		S		S	
Shaft and bearing of idler gear 2		S		S	
Shaft of pulley assembly		S		S	
Shafts of torque change gear and FR drive gear		S		S	
Shaft of pressure roller arm		M		M	
Guide roller base moving sections in chassis					M
Surface of contact between cylinder motor base and guide roller base during loading					M
Surface of contact between tension arm and supply guide roller base					M

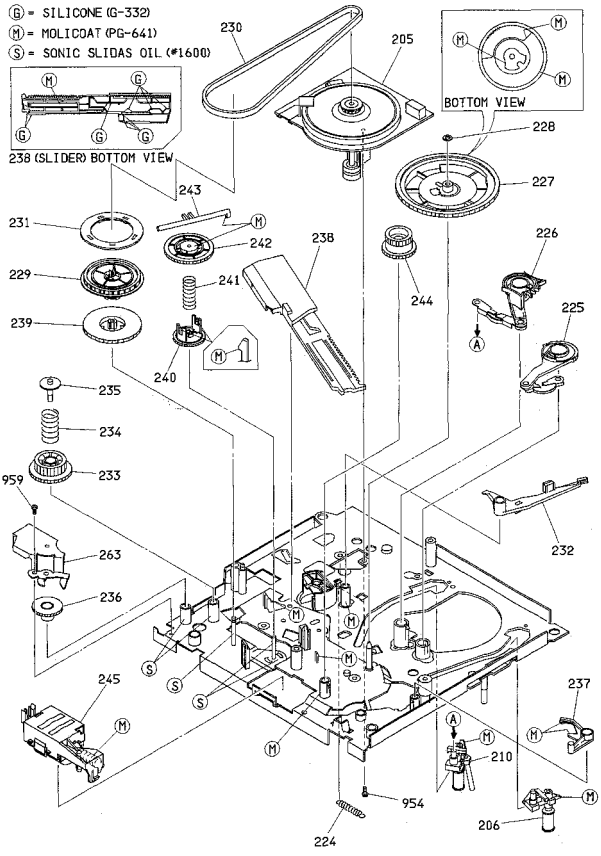
R: Replacement of parts
C: Cleaning
S: Lubricating oil (Sonic Slidas oil)
M: Coating grease (Molicoat)

1. US-MECHANISM (TOP VIEW) SECTION

Ⓜ = MOLICOAT (PG-641)
Ⓢ = SONIC SLIDAS OIL (#1600)
Ⓖ = SILICONE (G-332)

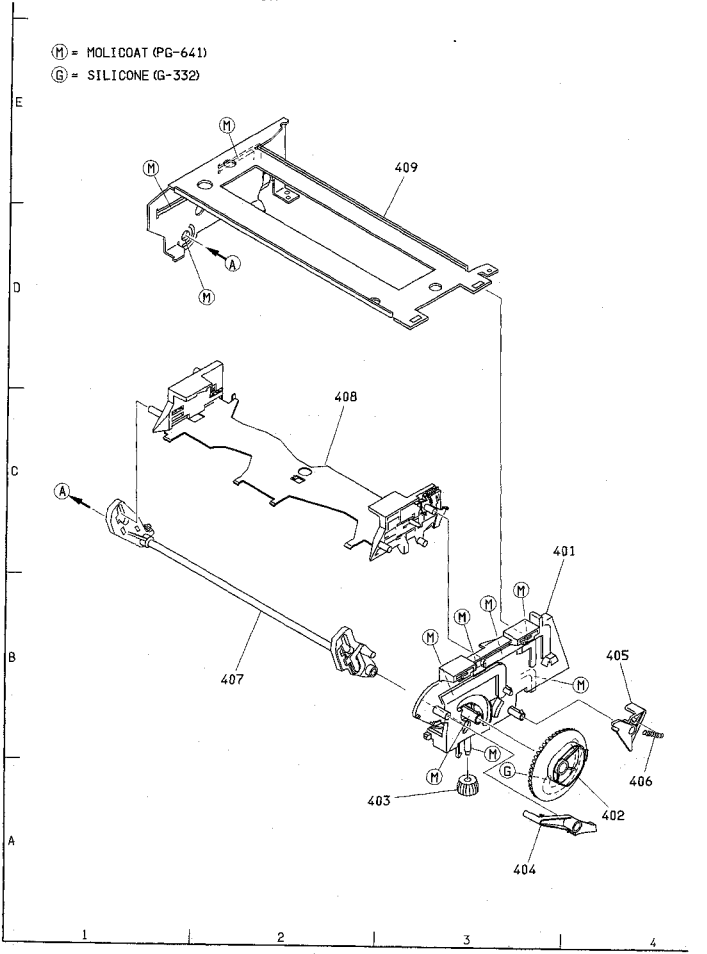


2. US-MECHANISM (BOTTOM VIEW) SECTION



3. US-FL MECHANISM SECTION

Ⓜ = MOLICOAT (PG-641)
Ⓖ = SILICONE (G-332)



Identifications of Components in US Mechanism

Index No.	Component
201	Impedance roller
202	Impedance plate
203	Head cleaning (HC) mechanism
204	FL mechanism assembly
205	Capstan motor
206	Guide roller base (I) assembly
210	Guide roller base (O) assembly
212	Tension arm
213	Spring
214	Tension band
215	P. drive gear
216	PR idler gear
217	P. out arm
218	Spiral gear
219	Pressure roller arm
220	Cylinder base
221	A/C head assembly
223	FE head
224	Spring
225	Loading gear (L)
226	Loading gear (R)
227	Cam gear
228	Poly-slider washer
229	Pulley assembly
230	Drive belt
231	Flange
232	FS brake
233	FL change gear
234	Spring
235	Spring hook
236	FL idler gear
237	Take-up operation arm
238	Slider
239	Transmission gear
240	FR drive gear
241	Spring
242	Torque change gear
243	Torque change arm
244	LM wheel gear
245	Loading motor assembly
246	Idler gear 1
247	Idler gear 2
248	Supply reel disk
249	FR arm
250	Take-up reel disk

Index No.	Component
251	Stopper
252	Take-up brake
253	Take-up brake spring
254	Brake (L)
255	Brake (R)
256	Spring
257	Jog gear
258	Jog arm
259	Safety arm
260	Spring
261	Supply subbrake
262	Spring
263	Base bracket
264	Washer
265	Spring
401	Side bracket (R)
402	Bevel gear
403	FL gear
404	Door arm
405	Switch arm
406	Spring
407	Drive arm
408	Cassette holder
409	Side bracket (L)
501	Cylinder motor
951	Screws (3 x 8)
952	DT screws (2.6 x 10)
953	DT screws (2.6 x 6)
954	BT screws (2.6 x 6)
956	Screws
957	Screws (M2.6)
958	DT screws (2.6 x 8)
959	DT screws (2.6 x 5)